Caring Through Music: Music Therapy and Opera Therapy

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3.1 Historical Aspects

The role and contribution of music for treatment and healing was already known and recognized in the ancient and classical world. Reminiscences of this empirical mode of therapy are still found today in many music of the popular world [1], but in classical Greece Apollo, father of Asclepius, considered the protector of medicine and music, deserves to be remembered. Pythagoras, Plato, and Aristotle in some of their writings have highlighted the positive effect of music on the psyche and body, underlining its beneficial relaxing and invigorating effects.

The birth of music therapy as a scientific method of treatment dates back to the first half of the eighteenth century. The first systematic treatise on music therapy was published in 1749. It is the book "Reflections on ancient and modern music with the application to the cure of disease" by the London doctor and musician Richard Brocklesby [2]. This was followed in 1758 by another important contribution by the French doctor Louis Roger, which highlights the importance of music for the treatment of diseases related to a decreased mood [3]. We cannot overlook the importance that Franz Anton Mesmer attributes, in the context of his therapeutic practices, to music as an element for determining hypnotic suggestion. The relations he establishes with Wolfgang Amadeus Mozart in this regard are such that the latter will not hesitate to include more than an explicit reference to mesmerism in his comic opera *Cosi fan tutte* (1790).

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The doctor and musician Peter Lichtenthal in his "Treatise on the influence of music on the human body and its use in certain diseases" (1811) [4] is the first to identify which pathological conditions can derive the greatest benefits from music therapy. In his opinion, fevers, both acute and intermittent, chronic pain, asthenic diseases, convulsions, and diseases of the mind (including dementia) are those that have the greatest benefits from music, provided that the doctor takes into account the particular characteristics of every patient in the choice of musical pieces and knows how to integrate this treatment modality with other more traditional therapeutic means.

The scientific positivism of the late nineteenth century and psychoanalysis of the early twentieth century contribute to ensuring that in the early years of the new century the music therapy approach for the treatment of behavioral disorders becomes relevant in the United States thanks to the research carried out by neurologist James Leonard Corning, who he is also the first doctor to experiment, alongside traditional listening to music, the use of lyric pieces taken in particular from works by Richard Wagner [5]. In particular, during the First World War in the Anglo-Saxon world, the music therapy approach was frequently used for the treatment of post-traumatic stress disorder (shellshock) with good clinical results.

In the following decades, music therapy enters more and more frequently among the integrative treatments for the treatment of various pathologies (psychic and neurological in particular, but also rheumatological and oncological); until towards the end of the twentieth century, a series of systematic researches on this modality therapeutic has definitively sanctioned its scientific legitimacy [6].

3.2 The Importance and the Role of Music Therapy

Today there are more and more people throughout the Western world who decide to turn to "complementary" or "unconventional" medicine, to treat chronic ailments such as headaches, back pain, and anxious-depressive neurosis, or in search of hope if affected by diseases incurable or terminal. Without entering into the too passionate controversy between proponents and detractors of these methods, complementary medicines promote human care through the exploration of every aspect: physical, psychological, emotional, cognitive, social, and spiritual. One of the most frequent criticisms of the proponents of nonconventional medicines to contemporary medical practice is the inattention to the emotional side of the disease, therefore the excessive effort in demonstrating "the objectivity of the observed data." According to this opinion, the excessive search for "objectivity" of scientific medicine would end up diverting the act of health care from its original purposes. On the contrary, the disease, according to a modern "holistic" point of view, should be faced with integrated assistance, aimed at improving the quality of life, where health procedures, priority for the biological aspects of the therapy, can be accompanied by other nonmedical interventions, but always aimed at achieving the psychophysical well-being of the person. Recent data from the World Health Organization (WHO) indicate that 15% of Italians resort to complementary medicine at least once a year.

In the United States and in the rest of Europe, "holistic" interventions are more widespread and are usually conducted in full autonomy by an operator expert in complementary methodologies, in agreement with doctors, nurses, and other health professionals.

Music therapy is currently one of the most widely used complementary methodologies in the health and social care sectors. According to the musicologist Pier Luigi Postacchini, it can be defined as "a technique by which various professional figures facilitate the implementation of projects of spatial, temporal and social integration of the individual, through strategies of harmonization of the functional structure of the handicap, through the use of the musical parameter […], pursued with a work of affective tuning, which are possible and facilitated thanks to specific strategies of non-verbal communication" [7]. This vision is today highlighted according to the most current and specific definition of the World Federation of Music Therapy (WFMT), for which "music therapy is the use of music and/or musical elements (sound, rhythm, melody and harmony) by of a qualified music therapist, with a client or a group, in a process aimed at facilitating and promoting communication, relationships, learning, motor skills, expression, organization and other relevant therapeutic objectives, in order to satisfy his physical, emotional, mental, social and cognitive needs" [8]. In other words, music therapy aims to develop the potential and/or residual functions of the individual in such a way that it can better achieve intra- and interpersonal and, consequently, can improve the quality of one's life thanks to a preventive, rehabilitative, or therapeutic process.

Music therapy has precise neuroscientific bases that start from the principle that sensory input is able to facilitate, through the structures of the temporal lobe, the processes of attention, observation, and learning managed by the frontal lobe; it can be hypothesized that pleasure is conscious or unconscious, evoked by listening and/or by musical practice, that is able to trigger neurobiological processes of a reparative type. In other words, the harmony, melody, and rhythm of a piece of music, enjoyed in a context of harmony and empathy with the group and the therapist, could lead back conflicting parts of the mind-body to a cognitive and affective-relational recompositing. That is, music, with its facilitating pleasure and sometimes of reparative regression, is able to penetrate the circuits of the central nervous system facilitating thought and rebalancing behavior.

There is now considerable scientific evidence regarding the mechanisms underlying the functioning of music therapy. In the last twenty years, functional neuroimaging of the central nervous system has opened unimaginable scenarios until a few decades ago, on the neurobiological involvement of anatomical structures responsible for learning, thinking, and behavior following musical stimulations. As far as our experience is concerned, neurological diseases of a chronic and progressive degenerative type (such as Parkinson's disease and Alzheimer's disease) have greatly benefited from music therapy treatments administered with standardized techniques, with statistically significant benefits, detected with scales and validated, both functional and in terms of quality of life.

3.3 Clinical Applications of Music Therapy

There are many pathologies that can benefit from music therapy. The music therapist has the ability to work with a variety of patients, both children and adults, who may have emotional, physical, mental, or psychological handicaps. Therefore, music therapy can be applied to all age groups and in a variety of care settings. Music, in fact, has a nonverbal quality and offers a wide range of verbal and vocal expression. The sonorous-musical element of music can acquire therapeutic connotations in two operational sectors: psychotherapy and rehabilitation. In the psychotherapy sector, the sound-musical element becomes a nonverbal communication channel that can favor the establishment of particular forms of interpersonal relationships. In the rehabilitation sector, on the other hand, music acts as a stimulus for a specific function (motor, vocal, cognitive, etc.) and constitutes the formal model within which this function is articulated [9].

An intense research work has been underway for some decades, with participation in conferences and congresses and through scientific publications in national and international journals, with the ultimate aim of contributing to better "characterize" this discipline and then "clear it through customs," once validated, in the field of modern neuroscience. However, there is still a long way to go and an increasingly intense comparison of clinical research is required, a further discussion of both paradigmatic and unusual clinical cases, and the preparation of multiple research protocols aimed at the acquisition of further scientific data.

How do you choose a "therapeutic" piece of music? It must ignore aesthetic considerations (such as "beautiful and pleasant music"), but the musical piece must rather have the purpose of stimulating dormant psychic areas, involving more complex affective levels. Some music, more than others, have these powers and are the ones that affect the world of affection. In terms of musical choices, there is a somewhat confused literature because often the author and the genre of music are decided without taking into account the "type of listener." On the contrary, we believe that the patient should be at the center of our interests; otherwise, the risk is that of offering music that only appeals to the one who administers it. Only a careful musical history will allow us to understand what musical culture the patient possesses and in what sound environment he has lived.

But what are the peculiar characteristics that give music a therapeutic efficacy? We will try to propose some possible answers. New music, that is, never listened to, leads to the development of some fundamental psychic functions such as attention and a certain expectation which, in turn, are able to arouse emotions and new associations. Listening to music never heard before can be "kidnapped" and induced to explore a new planet. However, we believe that even the musical pieces already known—that is, whose development of musical themes we know—by evoking memories linked to specific temporal and spatial circumstances can make us achieve interesting goals. Furthermore, most scholars of music therapy seem to favor classical music, attributing only therapeutic powers to it. There is no doubt that there has been greater research in this musical area, probably because in addition to

proposing a rich and articulated message, this is also a musical genre that has already been widely tested over time and known to the general public.

For our therapeutic purposes we have built different sound paths, which are adapted from time to time to the individual patient or to the group and which include pieces of classical music, jazz, pop, light music, from films, etc. However, we want to affirm with conviction that the secret of the *therapeutic path* lies not so much in the choice of the type of musical piece, as in the logical placement of the pieces themselves. That is, the problem is the following: once the starting piece has been identified, which other pieces should we add and in what order to obtain the result we want? There is no precise rule. And this is why an accurate musical anamnesis is required, carried out by a music therapist with a high technical and cultural profile.

Music therapy is indicated in different types of pathologies, since even patients who are not cooperating due to their physical conditions (bedridden, disabled, or in a coma), or psychic (with dementia or mental retardation), or very young children, can benefit from it. In particular, a great efficacy is universally evident particularly in four specific sectors: palliative care, vegetative states, Alzheimer's dementia, and Parkinson's disease [10].

Palliative Care Music is used in clinical situations of chronic pain, in terminal pathologies, and in their therapies. Intractable pain is one of the most frequent and painful consequences of neoplastic pathologies and, often, it is necessary to resort to narcotics that are not free from side effects. In this context, receptive music therapy has been used successfully in relieving neoplastic pain in patients receiving fixed doses of analgesics. On the basis of these observations and a long French tradition dating back to the monks of Cluny (eleventh century), music thanatology was proposed, intended as a palliative medical intervention used to satisfy the complex physical and spiritual needs of the dying patient. In other words, music can also be used as a means to improve the patient's "quality of death," when there is nothing left to do but accompany him "lovingly" in the last steps of his journey.

Vegetative States The use of music therapy in the state of coma is current and of great prominence. Sound stimulation, especially if relevant to the patient's emotional memory, can play a role in the attempt to establish contact, acting on an affective, cognitive, and relational level.

Dementias Among the neurogeriatric pathologies, music therapy finds an important implementation in dementias, especially in relation to the characteristic behavior and mood disorders. In fact, music can be used to reduce aggression, especially during meals, or to improve the quality of life of institutionalized patients. In Alzheimer's disease, the music therapy intervention was also aimed at the rehabilitation of specific motor, cognitive, and psychic functions [11].

Parkinson's Disease In this pathology a method of active music therapy has recently been proposed for the recovery of emotional and motor functions, characterized by the loss of rhythm and kinetic synchrony. This method has been articulated in such a way as to use musical instruments, the body, and the voice in making music, or even "noise," to stimulate the recovery of harmony and speed of movement, the vocal tone, and the expressiveness of the face with improvement of the quality of life. Focusing on the physical, psycho-emotional, and social impact of Parkinson's disease from the point of view of the sick individual, a coordinated set of rehabilitation interventions was developed, assigning priorities according to the repercussions of these interventions on the quality of life of the patient. These rehabilitation interventions—which are based on a harmonious integration between scientific medicine and complementary medicine—have the ultimate aim of alleviating the suffering of Parkinson's patients to whom it is unfair to promise an unattainable recovery, but with which the necessary synergies must be made, to avoid isolation and to combat that sense of helplessness that takes both the sick and their families [12–17].

It can therefore be said that the most significant qualitative leap that has taken place in recent years in the therapy of a disease is to be ascribed to the awareness, ever more explicit and widespread, of the value of a new and different *philosophy of management of the sick person*, at the same time global and individualized, capable of placing at the center of its interests, not only motor disorders, but the "person" as a whole. The consequences deriving from this change of perspective are many and profound: the primary target of the treatment becomes the *patient's quality of life* and not just physical autonomy. Not only that, the treatment is transformed from a simple administration of active ingredients into an *integrated and personalized treatment plan* and the information of the patient and his family members has the aim of reaching not only a better *compliance,* but a real *therapeutic alliance*. For this purpose, the use of music therapy fits well, which in the sense of the term is placed among the complementary bio-natural disciplines that aim to maintain or recover the person's state of well-being. In fact, music therapy is deliberately not intended to "replace" official medicine, but to integrate with it, stimulating the person's vital resources through natural facilities such as the sound, rhythm, and noises of nature.

3.4 A New Dimension of Care: Opera Therapy

Historically, after the aforementioned initial sporadic attempts to use James Leonard Corning's listening to lyrical music for curative purposes, also in the United States, during the years of the Great Depression, a large program called the Federal Music Project promoted by the government and led by the musician Nikolai Sokoloff, it was aimed in particular at people of different ages with neuropsychic disorders (Fig. 3.1).

It used different musical genres for rehabilitation and therapeutic purposes, including melodrama (opera and operetta), drawing a wide range of sensations from their music: contentment/sadness, happiness/melancholy, pleasure/pain, and restlessness/vivacity [18]. After these first experiences of opera therapy only in the last two decades have systematic scientific research been undertaken to demonstrate the positive influence of this integrative music therapy approach in medicine [19]. The role of classical music in the treatment of numerous pathologies has been known for some time [20, 21], while there are few studies on the possible benefits of melodrama in the medical field. The study of the variation of physiological parameters in healthy subjects (professional musicians or simple passionate music listeners) highlighted in the monitored subjects significant correlations between cardiovascular picture (decrease and regularization of heart rhythm and blood pressure), respiratory rate, and musical profile, in particular with reference to two of the most famous operas by Italian composers—such as some arias from Giacomo Puccini's *Turandot* (1926) and Giuseppe Verdi's "Va, Pensiero" choir of *Nabucco* (1842)—with no qualitative difference between musicians and nonmusicians [22] (Fig. 3.2).

Fig. 3.1 Federal Music Project. Federal Music Project, U.S. *Works Progress Administration Federal Music Project of New York City Theatre of Music Presenting chamber operas, symphony concerts, grand operas, and chamber music at popular prices*. New York, None. [Nyc: federal art project, between 1936 and 1941] [Photograph] Retrieved from the Library of Congress. Laquatra, J., Mérimée, P. and Federal Music Project, U.S. (1939) *"Carmen" Presented by Cuyahoga County Opera Association and the Federal Music Project: Ballet directed by Madame Bianca*. Ohio, 1939. Ohio: Federal Art Project. [Photograph] Retrieved from the Library of Congress

These results have helped to understand how opera music can transmit emotions capable of improving specific cardiovascular responses, both in healthy subjects, a function of a better increase in some sports performances, and in sick subjects such as heart patients. For these effects mediated by the autonomic nervous system, some studies have shown how the auditory and visual use of melodrama improves the performance of students in schools and universities.

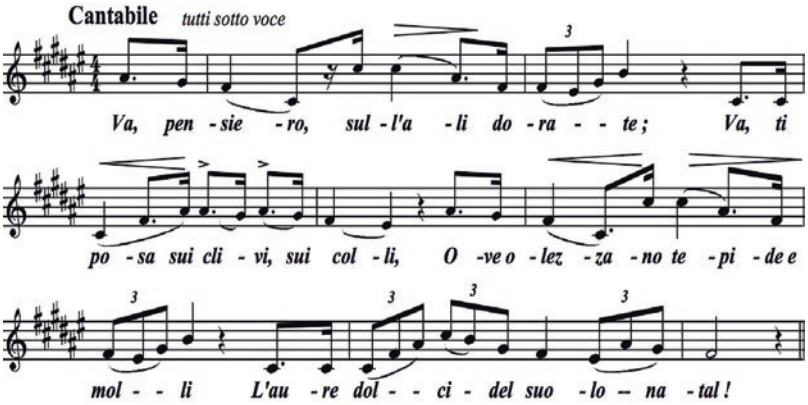
Opera can also play a positive role in overcoming social differences and ethnic discrimination between people of different cultural backgrounds, managing to increase the degree of tolerance and mutual understanding. On the basis of these encouraging results, studies have been undertaken to evaluate the use of the practice of operotherapy in various diseases such as cancer, disturbances of consciousness, and coma, opening new dimensions of integrated care in the context of frequent and recurrent pathologies [23].

Studies with functional magnetic resonance (fMR) show that, although there are no real "musical centers" in the brain, however, compared to listening to a generic noise with a fixed tone, the brain areas activated by music, even if adjacent, are different from those involved in language (both in listening and in reading). This anatomical-functional separation confirms the great autonomy of music with respect to language, regardless of whether the code is visual or auditory. Neuroscience therefore confirms that even simple listening to music is a formidable way to put into action or reactivate multiple neuronal networks: from attention to memory, from learning to creativity, and from emotional to motor processes.

They also show how the brain is able to select and understand the emotional nuances of sounds through specialized neuronal populations of the frontotemporal cortex, both of the voice and of music, distinguishing the connotations that evoke positive sensations from those that provoke negative sensations: a vocal/musical intertwining that blends wonderfully in operas.

Music then, especially when it interacts with singing and movement (as happens in opera and ballet), is a formidable tool capable of positively affecting neuroplasticity, which is the ability to "remodel" synaptic connections (the physical modalities through which neurons speak and communicate with each other) and a formidable generator of neuromodulators (the liquid words) positive for our well-being: serotonin, dopamine, and endorphins. This is why music can represent, as we have seen, an excellent therapy for serious diseases: from Parkinson's to Alzheimer's, from depression to acute anxiety. And next to music therapy even more so is opera therapy, that is, listening to and viewing the opera, which, by combining music, singing, and gestures, plays an even more beneficial action on the healthy and more distinctly therapeutic on the sick [24, 25].

The importance of a possible chromatic component in listening to music had already been noted and highlighted in the past (Lichtental mentions it in his work on the influence of music on the human body, cited above), but a scientific understanding of this experience is today possible thanks to that sensorial/perceptive neurological phenomenon called synesthesia, which is a "contamination" of the senses in the perception that occurs when stimuli that arrive through a sensory or cognitive path induce automatic experiences related to another sensory or cognitive path: for



Va, pensiero, sull'ali dorate;
va, ti posa sui clivi, sui colli,
ove olezzano tepide e molli
l'aure dolci del suolo natal!

Fly, my thoughts, on wings of gold;
go settle upon the slopes and the hills,
where, soft and mild, the sweet airs
of my native land smell fragrant!

Fig. 3.2 The first passages of "Va, pensiero" *Nabucco* (1842) of Giuseppe Verdi. Promotional poster, by Illustrator Leopoldo Metlicovitz (1868–1944) for Giacomo Puccini's opera "Turandot," on April 25, 1926

example, in our case "seeing" the musical notes as colors and observing a chromatic overview while listening to music is a not infrequent synaesthesis experience [26–28]. Paradoxically, the association of colors and sounds can be better influenced and modulated during the viewing and listening of the opera, which can already materially show during the performance of a piece of music, the colors of the costumes, the chromatism of the scenography, or the color dynamics of ballets.

3.5 Conclusion

Compared to traditional music therapy, opera therapy determines a greater and more intense emotional, sensory, and physical involvement. Even listening to music and singing alone play a more important role of "neuropsychological entrainment" than traditional music therapy. Attending an opera performance—both in the theater and even simply through the recording of the melodrama—determines an even more powerful involvement. It implies the use of sight (which is stimulated by the scenography and stage costumes) and motor participation (determined by the movement of the characters on stage and by the development of the narrative action) which probably involve the "mirror neurons" in such a way to provoke a psychophysical "rebalancing" capable of positively influencing multiple pathological conditions.

In this sense, it is conceivable to assume that changes in brain neuroplasticity may over time be induced both by music therapy and even more by opera therapy and that these brain changes are at the origin of the observed therapeutic benefits. This perspective suggests that the well-established use of music therapy and the use of opera therapy still in the experimental phase may represent real and important integrative therapeutic possibilities to improve the treatment of the suffering of sick patients.

References

1. Sironi VA, Riva MA. Neurological implication and neuropsychological consideration on folk music and dance. Prog Brain Res. 2015;217:187–205.
2. Brocklesby R. Reflections on ancient and modern music with the application to the cure of disease. London: Cooper; 1749.
3. Roger L. Traités des effects de la musique sur le corp humain. Paris: Brunot; 1801.
4. Lichtenthal P. Trattato dell'influenza della musica sul corpo umano e sul suo uso in certe malattie. Milano: Silvestri; 1811.
5. Davis WB. The first systematic experimentation in music therapy: the genius of James Leonard corning. J Music Ther. 2012;49:102–17.
6. Rose FC, editor. Neurology of music. London: Imperial College Press; 2010.
7. Postacchini PL, Ricciotti A, Borghesi M. Musicoterapia. Roma: Carocci; 1997.
8. Bunt L, Hoskyns S, Swami S. The handbook of music therapy. London: Routledge; 2013.
9. Altenmüller E, Schlaug G. Neurologic music therapy: the beneficial effects of music making on neurorehabilitation. Acoust Sci Technol. 2013;34:5–12.

10. Brancatisano O, Baird A, Thompson WF. Why is music therapeutic for neurological disorders? The therapeutic music capacities model. Neurosci Biobehav Rev. 2020;112:600–15.
11. Dowson B, Schneider J. Online singing groups for people with dementia: scoping review. Public Health. 2021;194:196–201.
12. Masahiro O, Masahiro S, Kazutoshi K. Paired synchronous rhythmic finger tapping without an external timing cue shows greater speed increases relative to those for solo tapping. Sci Rep. 2017;7(1):43987. https://doi.org/10.1038/srep43987.
13. Thaut MH, Ruth RR, Thenille BJ, Corene PH, McIntosh GC. Rhythmicauditory stimulation for reduction of falls in Parkinson's disease: a randomized controlled study. Clin Rehabil. 2019;33(1):34–43.
14. Devlin K, Alshaikh JT, Pantelyat A. Music therapy and music-based interventions for movement disorders. Curr Neurol Neurosci Rep. 2019;19:83.
15. Barnish MS, Barran SM. A systematic review of active group-based dance, singing, music therapy and theatrical interventions for quality of life, functional communication, speech, motor function and cognitive status in people with Parkinson's disease. BMC Neurol. 2020;20:371.
16. Bergna A, Zanfagna E, Ballabio A, Vendramini A, Bressan LC, Solimene U. Efficacy of the osteopathic treatment in Parkinson's disease. Bull Rehabilitat Med (Вестник восстановительной медицины). 2021;20(2).
17. Fodor DM, Breda XM, Valean D, Marta MM, Perju-Dumbrava L. Music as add on therapy in the rehabilitation program of Parkinson's disease patients: a Romanian pilot study. Brain Sci. 2021;11:569.
18. Davis WB. Music therapy practice in new York City: a report from a panel of experts. J Music Ther. 1997;34:68–81.
19. Lorusso L, Porro A. Opera and neuroscience: a historical approach and its relevance today. In: Colombo B, editor. Brain and art. Cham: Springer Nature; 2020. p. 81–94.
20. Edwards J. The use of music in healthcare contexts. A select review of writings from 1890s to the 1940s. Voice. 2008(2):1–19.
21. Gardner B. Therapeutic qualities of music. Mus Lett. 1944;25:181–6.
22. Bernardi L, Porta C, Casucci G, et al. Dynamic interactions between musical, cardiovascular and cerebral rhythms in humans. Circulation. 2009;119:3171–80.
23. Young H, Baker F, Shoemark H. Song preference of Chinese older adults living in Australia. Aust J Mus Ther. 2014;25:103–21.
24. Altea P, Bellavigna R, Camaghi R, Corti N, Delicati F, Downie G, Pozzi L, Corno L. Musicoterapia con il malato di Alzheimer, Progetto Anziani Musicoterapia PAM. Milano: Federazione Alzheimer Italia; 2003.
25. Leggieri M, Thaut MH, Fornazzari L, Schweizer TA, Barfett J, Munoz DG, Fischer CE. Music intervention approaches for Alzheimer's disease: a review of the literature. Front Neurosci. 2019;13 https://doi.org/10.3389/fnins.2019.00132.
26. Braganca GFF, Fonseca JGM, Caramelli P. Synesthesia and music perception. Dement. Neuropsychology. 2015;9:16–23.
27. Triarhou LC. Neuromusicology of Musiconeurology? "Omni-art" in Alexander Scriabin as a Fount of ideas. Front Psychol. 2018;7:1–7. https://doi.org/10.3389/psyg.2016,00364.
28. Lorusso L, Ione A, Franchini FA, Porro A. Music synesthesia and wellbeing. In: Colombo B, editor. The musical neurons. Cham: Springer Nature; 2022.