Music Education Reform for Muscular Disease Prevention and Treatment

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Abstract

The incidence of neuromuscular and skeletal diseases related to performance am keyboard instrument players has been high, often limiting or terminating their learning and playing careers. Injured pianists are eager to find solutions and so-called scientific methods to develop injury prevention techniques, but these methods have not been seriously studied. Based on the researcher's 5 years of full-time and part-time teaching reform practice in the Keyboard and Instrument Department of Inner Mongolia Academy of Arts, this study investigated an interdisciplinary and nontraditional piano teaching method.

This method has received considerable public praise from industry insiders, but no systematic research has been conducted to determine its efficacy in restoring and preventing neuromuscular bone diseases and recurrence, as well as its impact on technology The influence of musicality and extra muscular factors. Participants include undergraduate and graduate students, amateur pianists (enthusiasts), and organists (enthusiasts) who have studied the method for at least two semesters between 2020 and 2022.

The results of survey and interviews indicate that participants believe that this method is very helpful in promoting the recovery of neuromuscular and skeletal diseases interview participants have reported improvements in technology and musicality, and many have also reported improvements in their spare time lives. This study hopes that these data can serve as a starting point for the wider promotion of the Piano performance method as a useful model for the teaching of injury prevention piano techniques for piano majors.

Keywords: Inner Mongolia Academy of Arts; Keyboard Instrument Performance; Piano Playing Method

Introduction

Playing the piano is one of the most complex and multifaceted psychomotor activities known to man. Learning advanced musical repertoire requires more than just musical talent and aesthetic sensibility. It also requires subtle and repetitive use of the Musculo skeleton (Zhao, 2023).

For example, Jong-Yu Chu's Toccata has over 6,000 notes and is often played in five to seven minutes, which corresponds to a rate of 14 to 20 notes per second for a pianist. Such an activity, in itself, could be considered very demanding. However, the pianist must also understand and project the artistic, dramatic, and emotional content of the work, make its structure comprehensible, execute the notes in precise moments, and often play the work by memory in front of a silent audience on an instrument that may or may not be suitable for the pianist's anatomical and physiological characteristics. Furthermore, while the history of piano technique and pedagogy may include those pianists who are documented and the teachers who taught this technique, it is also rife with contradictions, confusion, quasi-scientific

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theories, and turf battles. Arguably, one could link this confusion, complexity, and contradictory information to the high rate of performance-related injuries that continue to exist today (Yang, 2023).

This dedication of energy, time, talent and financial resources can be compared to that of serious young dancers, gymnasts and figure skaters who must also combine artistic demands with complex neuromusculoskeletal activities. In fact, Wilson, a noted neurologist and pioneer of performing arts medicine, said, "There is little difference between serious musicians and serious athletes except this: musicians concentrate on perfecting control of the small muscles (or vocal cords) of the upper extremities. (organ) control, tends to be stationary when performing, and monitors his or her output primarily through the auditory system. The distinction between artists and athletes is more blurred than might be apparent: the activities of musicians and dancers require a motor component, while those of certain athletes contain an artistic component (Feng, 2023). For the pianist, the timing of hundreds, if not thousands, of consecutive keystrokes in a piece, combined with the relatively inactive but supportive large muscles of the trunk and legs, and the unique interplay of the numerous small muscles of the arms, hands, and fingers in rapid repetitive movements, add an additional layer of demand to an already challenging physical activity (Yang, 2023).

Gruber's study demonstrates a direct link between professional skill and practice time and shows that professional musicians devote approximately 10,000 hours over a 10-year period to achieve a high level of professionalism. There is a direct link between tactile acuity and the degree of piano practice. If a serious high school classical piano student practices an average of 300 days a year for two hours, she will have accumulated 2,400 hours of piano practice during her high school years. Furthermore, if a pianist studying for a bachelor's degree in music performance practiced an average of three hours a day for 300 days a year for four years, she would spend 3,600 hours practicing piano in repetitive motion (Zhang, 2023).

Thus a deep set of neuromusculoskeletal habits were formed at a relatively young age. As a piano graduate, I believe that piano practice is even more complex for the pianist, and that these physical demands are only one of many, including artistic, psychological, emotional, intellectual, economic, and even social challenges that a serious pianist must face to achieve any degree of success (Li, 2022). Moreover, such a pianist, like a dedicated athlete, usually exhibits an unusually high level of motivation and determination to succeed, often in spite of tremendous pressure from peers, parents, and society. This combination of personal dedication and the physical, artistic, emotional, intellectual, and psychological demands described above has been shown to place pianists in a potentially vulnerable position, including the risk of performance-related physical injury. Disturbingly, however, research has shown that even the risk of injury and the presence of pain do not reduce a musician's motivation to continue making music. One might well think that a serious pianist would have such a deep commitment to her art that she would be willing to tolerate or even ignore discomfort and pain-both of which are indicators of potential physical danger to the point of injury or even dysfunction (Xiao, 2022).

Research on performance-related injuries among musicians has kept pace with developments in the field of performing arts medicine; in 1998, Dandan Wang conducted a systematic review of published studies on performance-related piano performance muscle syndrome in musicians and found that the prevalence among musicians ranged from 34% to 62% (Lin, 2022).

Recent studies have shown that pianists experience even higher rates of performance-related musculoskeletal disorders. A systematic review of piano playing muscle syndrome in pianists conducted by the National Health Council in 2006 reported that performance-related injuries ranged from 26% to 93%. In a 2016 study of female pianists in Japan, 77% reported suffering some form of performance-related injury (Jiang, 2022). Additionally, in a 2020 Australian pilot study, 71.9% of professional pianists reported experiencing piano playing muscle syndrome (Mother Kwai Nam, 2022). Xiang-Yong Zhang, president of the Association for Performing Arts Medicine, stated in 2014 that pianists remain at approximately 50% risk of injury. Such injuries often result in physical, psychological, and financial hardship as they lose college scholarships, time and energy devoted to training, jobs, and ultimately the ability to create music (Zhang, 2022).

Research since the 1980s has produced occasional contradictory results in attempts to establish causal relationships between injuries and various postures, hand size, and various technical and pedagogical approaches, which has been further confounded. In a 2010 survey of Australian pianists, Julia Lu found no association between hand length and injury in pianists. Similarly, a Japanese study found that hand size was not a significant risk factor. However, in 2010, another Japanese study concluded that there was a relationship between small hands and an increased risk of piano playing muscle syndrome, and more recently, Qing-Hua Zhao documented the perceived benefits of reduced piano keyboards for pianists with small hands (Song, 2022).

Similarly, in an Australian study, Sun Danhong found an association between playing with the wrist in a neutral position and playing-related injuries, thus contradicting the literature on ergonomic studies. However, in a study on carpal tunnel syndrome, Sun Danhong (2022) had suggested a relationship between wrist flexion and hyperextension and piano playing muscle syndrome. A more unexpected result was a study that considered finger movement between the 3rd and 4th fingers as a risk factor. Such a finding contradicts the widely held assumption that wrist and finger dexterity and mobility are important components of a player's technique (Fu, 2022). Surprisingly, findings regarding the risk of piano playing muscle syndrome in female pianists versus male pianists are contradictory. Most disturbing are the results of a

systematic review of risk factors for piano playing muscle syndrome in pianists. The study revealed no consensus among the authors regarding risk factors for piano playing muscle syndrome. In addition, there was no common definition of musculoskeletal disorders associated with playing (Song, 2022).

Over the past three decades, several studies have advocated a multidisciplinary approach to teaching injury prevention piano technique. In fact, attempts have been made in neuroscience, neuro pedagogy, exercise science and technology-assisted pedagogy, and performing arts medicine to address the potential causes of competition- related injuries and effective pedagogy (Yin, 2022).

In the field of sport and dance, accepted models of technique or "basic form" and biomechanical principles have been developed over the past few decades. As a result of research in exercise science, kinesiology, and neuroscience, more effective and efficient teaching strategies have been developed to maximize motor skills and prevent injuries (Xing, 2022).

Given the motor nature of piano playing as a highly complex motor skill, components of these findings may be useful for technical models and instructional strategies. In addition, research in the areas of cognitive embodiment and physical education, including the Juilliard School Piano Performance Method and the Feldenberg Method, has yielded promising results that may be applied to piano technique and instruction. Finally, findings from martial arts, Zen Buddhism, and Asian music pedagogy, You-Ling Lee, have potential application to piano technique and pedagogy (Li, 2022).

Research Objectives

The purpose of this study was to investigate students' perceptions of the effectiveness

Research Methodology

This is a mixed method research which using several data collection tools was likely to obtain the most in-depth, reliable, and detailed information from students about their perceptions of their learning methods. A survey was conducted with population of 103 learners aged 22 to 72 and the sample size was 74. 26 key informants were choosing for interviewed.

Research Conceptual Framework

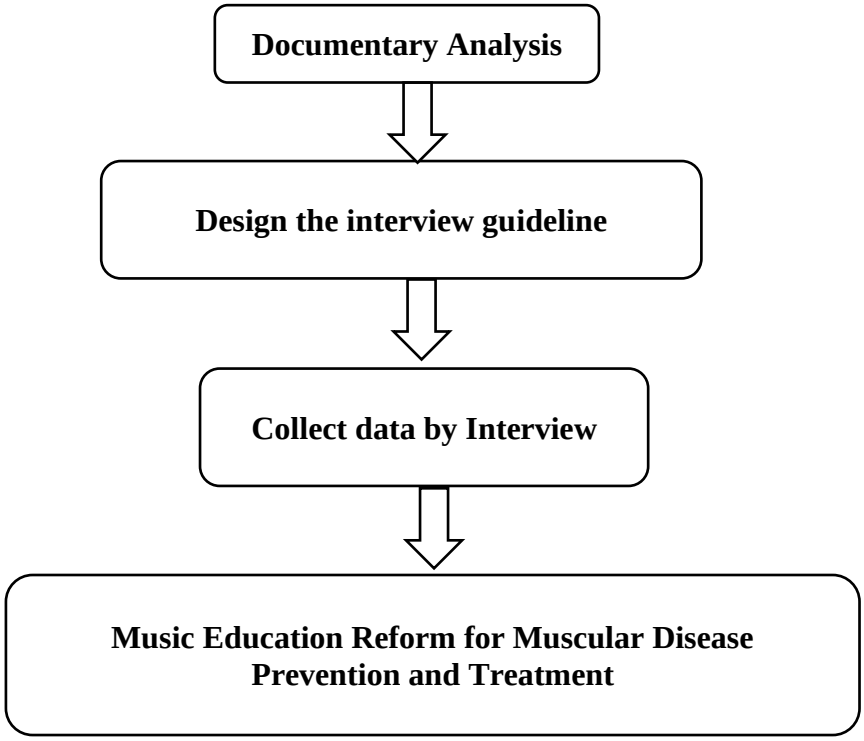

Figure 1 Research Conceptual Framework

Research Findings

During the interviews, a considerable amount of time was devoted to expressing their frustrations in finding a solution to their disease. I noticed that there are five categories.

1. Participants who believed that their discomfort and pain were just "normal".

2. Participants with uncertain definition of piano playing muscle syndrome or impairment, or who deny that they have Piano-playing muscle syndrome or injury, although they go on to describe a variety of symptoms.

3. Participants who conducted their own research on the Internet and self-diagnosed their piano-playing muscle syndrome

4. Have received a successful medical diagnosis, but the treatment method can only temporarily relieve symptoms

participants.

5. Believing that your diagnosis is inaccurate and that the only cure is to stop playing the piano participant

Discussion

Leadership in performing arts medicine should increase efforts to establish and promote core principles of efficient biomechanics to prevent injury in piano technique, as well as risk factors for injury (Li, 2022). Also, in this area, more attention should be paid to disseminating information in clear language so that the piano industry can understand.

A strong component of injury prevention techniques should be included in all graduate courses in piano pedagogy. Recent research has shown that this content is absent from most graduate degree programs in piano pedagogy in the United States (Liang, 2022). This section should relate to the teaching of piano technique for injury prevention to children and adults (Fu, 2022).

The Juilliard School Piano Method or some other means of physical education should be considered for inclusion in the requirements of undergraduate and graduate music degree programs across the United States (Yang, 2023).

Recommendation

1. Practical Recommendations

1. Structural flaws in the approach need to be addressed and corrected. Specifically, a clearer hierarchy of graded exercises and repertoire should be established, moving from one level of coordination to another, especially at the intermediate and advanced levels.

2. More attention needs to be focused on ensuring that each student's individual pace is deemed appropriate by the student and that student motivation and engagement are more diligently monitored.

3. The approach needs to incorporate better ways of teaching injury prevention techniques to younger generations as they face the challenges associated with living in today's technological, distracted, fast-paced world.

4. Future teachers of the method need to receive more careful and rigorous training to ensure that its underlying biomechanical principles are accurately communicated to students and that instructors demonstrate the intrinsic link between technique and musicality.

5. Teachers of the method must always keep in mind that the ultimate goal of the technique is compelling musical composition.

6. We need to place greater emphasis on teaching future instructors of the method professional tactile guidance. The perceived value of professional tactile guidance as a teaching tool must be emphasized.

7. A variety of creative, age- and level-appropriate lessons need to be created to effectively teach the method to both children and adults to beginners and pianists who have never experienced pianist muscle syndrome.

8. The approach requires careful study of its replicability and how it could be redesigned for insertion into piano pedagogy programs in higher education. The question is whether such an unconventional, interdisciplinary, holistic teaching paradigm fits into the more learning curriculum, or, conversely, whether it is possible or advisable to adapt the approach to a more traditional setting.

9.The developer of the method needs to review and revise all steps of the method as necessary to obtain accurate biomechanical information, to make the teaching of each step more effective, and to make the method better adaptable to more pianists

2. Recommendation for future research

Based on the results of this study, the investigators recommend consideration of

1. On the basis of research in physical pedagogy and several interdisciplinary studies in piano technology, it is necessary to conduct

2. Research that attempts to establish a baseline of the core principles of effective biomechanics and optimal body use of the piano.

3. Research should be directed toward creating a curriculum for training injury-preventive piano technique within a graduate degree program in piano pedagogy.

4. Before a gold standard of randomized controlled trials is designed to compare an injury prevention technique, performing arts medicine researchers should study the practices of piano teachers who are widely recognized in the music industry as teaching well-coordinated prevention Technical Principles of Injury. In this way, commonalities in the forms of biomechanics taught, as well as strategies for teaching these forms, can be discovered.

5. More research is needed to determine whether different biomechanical and physiological technical approaches have any effect, either perceptual or quantifiable, on tone production and tone quality.

6. A study is needed that examines the potential value of learning the Juilliard School method of piano playing alongside piano learning in preventing piano-playing muscle syndrome.

7. More research should be conducted to determine whether freehand tactile instruction is more effective than no freehand instruction in teaching the principles of good coordination in the piano.

8. Case studies should be conducted to determine whether this approach is effective as an intervention for pianists with focal dystonia and hyperactivity.

9. It may be helpful to delve deeper into the perceived effects of learning this method on performance anxiety, self-perception, and ability to maintain focus.

10. Comparing the approach to historical approaches, such as those of the Russian school of the early 20th century, may help identify commonalities in technique, musicality, and approach.

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