

# Musculoskeletal complaints in musicians

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## Valorisation

*“Valorisation is the process of creating value from knowledge, by making knowledge suitable and/or available for social (and/or economic) use and by making knowledge suitable for translation into competitive products, services, processes and new commercial activities”* (adapted definition based on the National Valorisation Committee 2011:8). Valorisation is next to education and research a core activity of universities. To describe valorisation in relation to the current thesis, I asked myself the following questions: “What is the relevance of these results? For whom, in addition to the academic community, are these research results of interest and why? Into which concrete services or activities can these results be translated? To what degree can results be called innovative in respect to the existing services? How can plans for valorisation be shaped?”

## Relevance

My interest in performing arts medicine was raised during medical school. As a fanatical amateur musician I started watching musicians play from a “biomechanical” point of view. With increasing knowledge regarding motor learning acquired during my residency in Physical Medicine & Rehabilitation I was more and more impressed with the elegance with which musicians play their instrument. An incredible refined fine motor control is a prerequisite to play the instrument in the best possible way. Not only the fine motor control, but also control over thoughts and emotions contribute to a great performance. Mental pressure while performing is high. Conductor, public and/or colleagues expect a perfect performance. Hence, while I was enjoying a beautiful concert, the musicians were constantly striving to perform at their best.

In general, the musician’s profession is seen as artistic and free. The fact that a musician’s occupation comes with high physical and mental demands is not widely recognized. Musicians are prone to developing injuries. This thesis focused on prevention of musculoskeletal complaints in musicians. Performing arts medicine is a relative young field of interest related to health care and research. Experts commonly agree on the relevance and necessity of educating performing artists regarding occupational health issues. Awareness regarding the often troublesome physical and mental health state of musicians is lacking. Professional musicians, frequently having experienced playing-related musculoskeletal disorders themselves, acknowledge the importance of health for a good playing quality. Music students are however less aware of their risk for developing musculoskeletal complaints and the consequences for playing quality. When starting this project, health care provided to music students at Dutch conservatories was limited. Some conservatories were more engaged with health policy than others. Health education ranged from incidental workshops to possibilities for on-site consultation of a physiotherapist or medical specialist. None of the participating conservatories offered obligatory and structural health-related courses.

## Target group

Main goal of this work was to research whether a prevention program could contribute to the reduction of disability due to musculoskeletal disorders. It was hypothesized that participation in a biopsychosocial health course could lead to increased awareness about the importance of health, educate students about healthy behaviour, playing posture, and learn them to deal with psychosocial aspects of being a musician. Students participated in a biopsychosocial course or a physical activity promotion course and results were compared. Disability levels seemed to decline over the course of 3 years in both groups. No differences between groups were observed in any of the primary or secondary outcome measures. However, students in the biopsychosocial group confirmed that they learned new aspects about prevention of physical complaints related to music making and found that the course was an addition to their education. The course created an open atmosphere to talk about physical and mental problems which is very important considering the taboo that encompasses musicians' health complaints. Results are in first place relevant for students at the conservatory, but also for music teachers and conservatory management. A limitation of the current research, as mentioned in the process evaluation, was that implementation was performed from an outsiders (research) perspective. For many reasons it would be more feasible if the conservatory itself was the driving force of the health course and adopted the course in its regular curriculum. Prior research reports that it is believed that music schools can change collective values, beliefs and actions of their students and could be able to induce a cultural shift increasing the focus on health behavior.<sup>1</sup> Both students and music teachers agreed that places of music education should offer structured health education related to playing the instrument.<sup>2</sup> In addition, experience from our trial reveals that students are more motivated to participate when they notice that the conservatory encourages the course. It is known that professional musicians have more health awareness and better attitudes to injury than students. Students expect guidance from their teachers on this theme, however teachers do not feel equipped to do so.<sup>2</sup> Therefore, involving music teachers in regular health classes at the conservatory will enable them to learn about musician's health and start incorporating health-related aspects in their music classes as well.<sup>3</sup>

Next to a health-related effect, there could also be a beneficial societal and economical effect of offering a prevention program to music students at the conservatories. If a prevention program is able to actually reduce complaints, this could decrease direct and indirect health care costs. Direct health care costs are costs for consulting a general practitioner, medical specialist, physiotherapist, diagnostics, medications, etc. Indirect health care costs are costs due to absenteeism, tutoring, study delay, or drop-out from study. Conservatory management could be especially interested in the results of a prevention program on preventing drop-out or disease to minimize these indirect costs for the school. Although we planned to perform a cost-effectiveness analysis of the randomized controlled trial, acquired data were limited and did not allow to perform a reliable cost-effectiveness analysis.

Work-related injuries have larger financial and societal consequences later on in the musician's career. Musicians work mostly on a freelance base or are employed by an orchestra. Freelance working musicians often have no insurance, meaning that if they are not able to work because

of disease, they do not have any income. This can have serious consequences for the family's financial situation and could lead to dependency of state support. Musicians who are employed by an orchestra are more likely to be paid when they are on sick leave. Professional associations, the musician's union, or employers of musicians could therefore also be interested in results from this first prevention trial in music students. It is acknowledged that results cannot be generalized from students to professionals one on one, still it is believed that the rationale of the prevention program is also applicable to professionals. Concluding, musculoskeletal complaints in musicians have an impact on health, society and economy. It is therefore important to implement effective preventive strategies, both for music students as for professional musicians.

## Activities/ products

Our results do not allow to advice on implementation of a specific program, however evaluation of the overall results of this thesis point to the supposition that one prevention program may not fit all musicians. An adequate analysis of the individual musician probably can help to select the best treatment, i.e. body posture, strength, endurance, scapulohumeral rhythm, and/or cardiovascular fitness. Besides, the influence of psychosocial factors as performance anxiety or stress should not be forgotten. An overlapping and recurring theme found to be a barrier for health promotion is the taboo to speak about one's problems. Our results did suggest that the biopsychosocial program was successful in stimulating discussions about health between students and their teachers. A larger cultural change is probably needed to be able to effectively address musician's complaints. This can only be accomplished when musicians, conservatories, unions, employers and performing arts specialist cooperate. Increasing awareness, knowledge, and motivation are the first important steps that need to be taken.

Based on information acquired during the project of this thesis, multiple activities have been undertaken to increase awareness and knowledge regarding playing-related musculoskeletal disorders for a diverse population. Next to the scientific output, we provided information for musicians, medical specialists and paramedics, and for the general population. An overview:

1. Musicians
  - a. Health workshop at conservatory
  - b. Health screening first year students conservatory
  - c. Publication of results in magazine: De Klarinet (The Clarinet)
2. Medical specialists / paramedics
  - a. Presentation for medical school students
  - b. Presentation for medical officers
  - c. Presentation for rehabilitation specialists
  - d. Workshop for rehabilitation specialists
  - e. Publication in postural exercise therapy magazine
  - f. Publication in ergonomics magazine
3. General population
  - a. Radio interview
  - b. Publication in newspaper

In summary, it was noticed that musician's health is an appealing subject for the general population. Medical professionals lack knowledge about the specific characteristics and needs of musicians. Music students highly appreciated the workshop and screening and professional musicians seem to be interested to learn more about specific playing-related health issues. We therefore conclude that there is a need to further educate medical professionals and musicians. Education for medical professionals is a core task of the Dutch Performing Arts Medicine Association (NVDMG) where medical doctors and therapists meet and discuss their collective vision to provide "custom made medical guidance for the performing artist." Media attention is one of the pillars by which an increased awareness and knowledge about performing artists' health can be acquired and it is strongly encouraged that members share their information publicly. Next, education of musicians is a shared responsibility for the educators at the conservatories and performing arts specialists. Cooperation is necessary to optimally increase awareness and knowledge.

## Innovation

During the course of this project, health care policy in conservatories has improved. More structural health screenings and courses are currently offered on a regular basis to music students. However, there still is a large variety between schools and courses are more practice-based than evidence-based. One innovative application is the performance of a health screening for first year music students conducted at the Sport Medisch Centrum Tilburg, in cooperation with the author of this thesis. Starting in the school year 2017–2018 all first year students were invited to participate in a health screening. Students filled out a screening questionnaire, as proposed by the Performing Arts Medicine Association, and were physically tested by a physiotherapist on aspects as physical condition, balance, strength, range of motion, and movement patterns. When playing-related complaints or psychological problems were present, students also consulted a physiatrist, specialized in performing arts medicine. Based on screening results, students received advice on how to optimize their health in relation to playing their instrument. Some students were surprised by the fact that they were invited for a health screening while pursuing a study in the arts; others were convinced about the importance of health when becoming a professional musician. It seemed that the screening did make the students aware of the importance of health, and provided them with relevant information on where to receive specialized care.

As this thesis pointed out, the current scientific knowledge regarding risk factors for musculoskeletal complaints in musicians is scarce. The contents and implementation of this health screening were therefore mostly practice-based, rather than evidence-based. There is no scientific evidence available that informs about which risk factors truly influence musculoskeletal complaints. The risk exists that tests are performed and advices are given that might be overdone. However, as these advices relate to optimizing health, it is believed these advices cannot harm the student. Benefit of implementing a health screening for music students at this time point is that it does create awareness on the importance of health for a musician and it lowers barriers to contact health professionals at moments truly needed. Future prospective research should assess the effectiveness of this health screening on the reduction of the (impact of) musculo-

skeletal complaints. The tests performed during screening should be continuously evaluated and critically approached. It would be interesting to find out whether costs of screening outweigh costs attributable to disease at a later stage in career. Further, it should be questioned who is responsible for the additional costs of this health screening: the student himself, the school, or the health care insurance? Next, it would be interesting to find out whether this health screening with treatment advice could also be marketed into a health plan for the professional orchestras. The employers or the musician's union could support these screenings for the employees / members. It should be investigated whether there is a market to introduce this new product.

To conclude, the value of this thesis, next to the scientific output, lies in its effect on the improved awareness on the importance of health for musicians in a wide population. Knowledge was translated into a diverse range of publications, presentations, a workshop and an innovative health screening for music students. Still, a structural, evidence-based, health care approach for musicians is a hope for the future / in Dutch: "TOEKOMSTMUZIEK."

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