

# Musicians' illness perceptions of musculoskeletal complaints

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Received: 12 January 2013 / Accepted: 25 January 2013 / Published online: 17 February 2013  
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**Abstract** The purpose of this study is to know the views of people about their illness, i.e., illness perceptions, determine coping strategies, and outcome. Previous research suggests a higher prevalence and a different perception of musculoskeletal complaints between musicians and nonmusicians. The aim of this study is to compare illness perceptions related to musculoskeletal complaints between musicians and nonmusicians. In this cross-sectional study, students from three music academies ( $n=345$ ) and one university medical center ( $n=2,870$ ) in the Netherlands received an electronic questionnaire concerning questions on sociodemographic characteristics, use of musical instruments, occurrence and characteristics of musculoskeletal complaints in the past year, and the Brief Illness Perception Questionnaire (B-IPQ). Baseline and B-IPQ scores were compared between the samples by means of  $t$  tests, chi-square tests, and regression models to adjust for differences in sociodemographic characteristics. Eighty-three music academy students and 494 medical students completed the questionnaire (response rates, 25.5 and 17.6 %, respectively). Seventy-four (89 %) persons in the musician group and 382 (78 %) persons in the nonmusician group reported occurrence of musculoskeletal complaints during the last 12 months. Adjusted for sociodemographic characteristics, the B-IPQ scores of the domains consequences (my illness is a serious condition), concern (I am extremely concerned about my illness), and emotions (my illness makes

me scared) were significantly higher among musicians, whereas personal control (there is little I can do to improve my illness), identity (number of symptoms patient sees as part of illness) were not significantly different. Music academy students had a significant more positive score on treatment control. Music academy students report more negative perceptions of their musculoskeletal complaints compared to medical students. Although some selection bias is present, this is supposed to have a minor effect on the outcomes of this study. Addressing illness perceptions in musicians with musculoskeletal complaints could have beneficial effects on physical and functional outcomes.

**Keywords** Illness perception · Musculoskeletal · Musician · Occupational

## Introduction

Musculoskeletal complaints are the most common cause of severe, long-term pain and physical disability in the general population, representing almost 25 % of the total health cost in European countries [1]. Certain occupational groups are associated with higher rates of musculoskeletal complaints. Musicians are more frequently affected compared to age- and sex-matched controls [2, 3, 4], with prevalence rates of musculoskeletal complaints ranging from 39 up to 90 % in adult musicians, depending on the severity of the complaint [5–9].

A wealth of factors influences the impact of musculoskeletal complaints on physical and psychological functioning [10]. Beliefs about a personal health condition, e.g., musculoskeletal complaints, are called illness perceptions. They are influenced by the personal experience of the illness and its management, cultural, and social factors such as experiences of illness in the social environment, and social comparison processes [11, 12]. In Leventhal's self-regulation model, illness perceptions are considered determinants of quality of life [13]. It is stated that

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patients are active problem solvers, who seek to make sense of illness; they form mental representations that influence coping strategies [13]. People regulate both their behavioral and emotional reactions to illness based on (1) the symptoms attributed to the illness, e.g., pain or numbness (*identity*); (2) beliefs about causes of the illness, e.g., overuse (*cause*); (3) curability or controllability of the illness (*cure/control*); (4) perceived consequences of the illness in everyday life, e.g., not being able to work (*consequences*); (5) expected duration of the illness, e.g., chronic or intermittent (*time line*). Patients with a strong illness identity, severe perceived consequences of the illness, low perceived controllability, and a chronic perceived time line have been shown to report low well-being in various chronic somatic diseases [11, 14–16]. These mental representations of illness (illness perceptions) partly determine how individuals respond to illness, and thereby their coping strategy; together, they determine the quality of life [10]. These findings have important clinical implications: illness perceptions are not merely predictors for the outcomes of various diseases [14–19], changing illness perceptions has been shown to be associated with improvements in outcome after interventions [12]. A recent review also showed that illness perceptions play a role in the work participation of patients [20]. Interventions targeted at changing these perceptions of how to deal with the occurrence of disease or complaints are promising [12, 17, 20].

Many musicians believe that pain is inherent to the level of performance they try to achieve [21]. Furthermore, injuries may be interpreted as presence of an inferior talent and thus as a failure as a performer [22]. Musculoskeletal complaints often result in not being able to perform at the necessary level. In the competitive environment where most musicians do not have a permanent job contract but rather do freelance work, minor complaints could immediately result in financial problems. As a result, almost half of the musicians in a study with playing-related injuries were not able to return to their career [23]. These factors stress the importance of research into the nature of illness perception of these musicians and to identify potential means of preventive and curative interventions in order to improve outcome of interventions for these professionals. Thus, the aim of this study is to compare perception of musculoskeletal complaints between musicians and nonmusicians.

## Methods

This cross-sectional study compares the scores on the Brief Illness Perception Questionnaire (B-IPQ) between music academy and medical students with musculoskeletal complaints during the past 12 months. The study was performed at four Dutch institutions: the Royal Conservatoire, the CODARTS University for the Arts, the Amsterdam School of the Arts, and the medical faculty of the Leiden

University—all between February and May 2011. Students from the aforementioned music academies, with a classical instrument as main subject, and medical students received an invitation. All students involved in the research spoke Dutch. Music academy students were selected from the student registries of the four institutions by employees of the musical academies. Medical students were selected from attendance lists from courses ranging from years 1 through 6. All eligible students received an e-mail with an invitation to complete the online questionnaire. After completing the questionnaire, students younger than 18 or older than 30 years were excluded in order to create a homogeneous population. The Medical Ethical Committee of the Leiden University Medical Center approved the protocol.

The electronic questionnaire comprised of the following items: sociodemographic characteristics, general health, musculoskeletal complaints, and illness perceptions. In [Appendix A](#) the content of the questionnaire is described.

For the assessment of illness perceptions of students with musculoskeletal complaints in both samples, the Dutch version of the Brief IPQ was used [24]. This questionnaire consists of nine items, eight questions are rated using a 0–10 response scale. Five of these items assess cognitive illness representations. The five domains are consequences (e.g., “my illness has major consequences on my life”, “my illness is a serious condition”), timeline (e.g., “my illness is likely to be permanent rather than temporary”, “my illness will last for a long time”), personal control (e.g., “there is little I can do to improve my illness”), treatment control (e.g., “my treatment will be effective in curing my illness”), and identity (rating of a number of symptoms that the patient sees as part of the illness). Two of the items assess emotional representations: concern (e.g., “I am extremely concerned about my illness”) and emotions (e.g., “My illness makes me angry, scared, upset, and depressed”). One item assesses illness comprehensibility (e.g., I understand my illness).

All statistical analyses were performed in SPSS. For continuous normally distributed variables, mean and standard deviation were calculated or median and range when not normally distributed. Baseline and B-IPQ scores were compared by means of *t* tests and chi-square tests. Regression models to adjust for differences in sociodemographic characteristics were employed.

## Results

The questionnaire was sent to 345 musical and 2,870 medical students. A total of 590 students completed the questionnaire, 87 music academy students (response rate, 25.5 %) and 503 medical students (response rate, 17.6 %), an overall response of 18.4 %. Thirty-three of the 135 students studying at the Royal Conservatoire completed

the questionnaire (response, 24.4 %), 26 of the 124 students of the Amsterdam school of the Arts (response, 20.9 %) and 24 of the 86 students of CODARTS University of the Arts (response, 27.9 %). Three individuals were excluded, all from the music academy students group because they were younger than 18 years. Another eight subjects were excluded since they were older than 30 years. Two subjects were excluded because of being a singer. Among 83 music academy students and 494 medical students, 74 music academy students (89 %) and 382 medical students (78 %) reported musculoskeletal complaints during the past 12 months.

The proportion of students reporting complaints of hands, wrists, elbows (54.1 and 28.3 %, respectively) and shoulders, neck, and upper back (87.8 and 60.5 %, respectively) was higher among music academy students compared to medical students.

The distribution of instruments of music academy students was: 24 (32.4 %) played a string instrument (e.g., violin, cello), 25 (33.8 %) played a woodwind instrument (e.g., flute, clarinet), 6 (8.1 %) played a brass instrument (e.g., trumpet, tuba), 16 (21.6 %) played percussion or keyboard (e.g., piano, timpani), and 3 (4.1 %) played a plucked string instrument (e.g., harp).

Characteristics of the population are presented in Table 1. The two groups were comparable for gender, cigarette and alcohol consumption, and hand dominance. Differences in age, study grade, hours of sport in a week, and body mass index have been found.

In Table 2, the results of Brief IPQ scores are depicted. Scores range from 0 to 10. Music academy students perceived significantly more negative perception scores compared to the medical students with respect to the domains consequences (4.5 and 2.7, respectively;  $p < 0.001$ ), personal control (6.1 and 6.7, respectively;  $p = 0.014$ ), identity (4.7 and 4.0, respectively;  $p = 0.037$ ), concern (3.9 and 2.3, respectively;  $p < 0.001$ ), and emotions (4.3 and 2.3, respectively;  $p < 0.001$ ). These differences remained significant when adjusted for age,

gender, study grade, smoking, sport, alcohol consumption, body mass index, and hand preference, except for personal control and identity. There was no significant difference, but still a negative tendency after the adjustments in the domains timeline (5.2 and 3.9, respectively;  $p = 0.108$ ) and comprehensibility (7.0 and 7.2, respectively;  $p = 0.176$ ). Music academy students had a significantly more positive score on treatment control (5.7 and 4.2, respectively;  $p = 0.003$ ), also after controlling for the aforementioned confounders.

## Discussion

Musicians report worse perceptions of their musculoskeletal complaints compared to medical students. This study shows considerable differences between the two groups with respect to the cognitive and emotional aspects of their complaints. Students at music academies perceive more severe consequences, are more concerned and emotionally more affected by their musculoskeletal complaints, compared to students at a medical school. These results support the hypothesis concerning a more severe impact of musculoskeletal complaints on musicians compared to nonmusicians [21, 22].

This study has some limitations: by choosing medical students as a control, a selection bias was created. Medical students might be more focused on health in general, even more they have different perceptions of the health system and pathology (i.e., “complaints”), possibly leading to different perceptions of their complaints [25]. On the other hand, two very different groups (i.e., presence of medical knowledge or not) will also make a contrast between two groups more evident. A second limitation concerns the relatively low response rate for both groups. This unfortunately happens quite often when questionnaires are involved in studies [26]. There are several reasons for not responding to a questionnaire and possible selection bias due to

**Table 1** Baseline characteristics of music academy students and medical students

	Music academy students ( $n=74$ )	Medical students ( $n=382$ )	Difference ( $p$ )
Age (years) (SD)	21.3 (2.2)	22.1 (2.6)	0.013
Gender (%)	Male: 18 (24.3 %) Female: 56 (75.7 %)	Male: 87 (22.7 %) Female: 297 (77.3 %)	0.746
Study grade (%)	Bachelor: 68 (91.9 %) Master: 6 (8.1 %)	Bachelor: 193 (50.5 %) Master: 191 (49.5 %)	<0.001
Smoking (%)	8 (10.8 %)	21 (5.5 %)	0.068
Sport (hours in 1 week) (SD)	2.2 (2.3)	2.9 (3.0)	0.021
Alcohol consumption (U/week) (SD)	3.9 (4.7)	5.3 (6.3)	0.129
Body mass index ( $\text{kg}/\text{m}^2$ ) (SD)	21.2 (3.1)	22.0 (2.5)	0.018
Hand preference (%)	Right: 62 (83.8 %) Left: 12 (16.2 %)	Right: 333 (86.7 %) Left: 51 (13.3 %)	0.538

**Table 2** B-IPQ outcomes of music academy and medical students with musculoskeletal complaints

	Music academy students with musculoskeletal complaints ( <i>n</i> =74)	Medical students with musculoskeletal complaints ( <i>n</i> =382)	Difference ( <i>p</i> )
Consequences (0–10)	4.5 (2.7)	2.2 (2.2)	<0.001
Timeline (0–10)	5.2 (3.4)	3.9 (3.5)	0.108
Personal control (0–10)	6.1 (2.2)	6.7 (2.4)	0.014
Treatment control (0–10)	5.7 (2.6)	4.2 (3.0)	0.003
Identity (0–10)	4.7 (2.6)	4.0 (2.7)	0.037
Concern (0–10)	3.9 (2.6)	2.3 (2.4)	<0.001
Understanding (0–10)	7.0 (2.1)	7.2 (2.4)	0.176
Emotions (0–10)	4.3 (2.8)	2.3 (2.4)	<0.001

nonresponders should be kept in mind. However, the prevalence of musculoskeletal complaints in both music academy students and medical students are in line with the literature [8, 27], underlining the representativeness of our samples. As the subjects of this study did not know in advance that they would receive questions concerning their perception of their complaints (and therefore did not choose to respond or not respond for this reason), and the fact that the prevalence numbers are in line with the literature, it is supposed that the B-IPQ outcomes of the students in this study are representative for all students who received an invitation. Summarizing, the effect of the bias due to the low response rate is probably very small. A third limitation concerns the difference in the localization of the complaints between the two groups, creating a possible selection bias with respect to musculoskeletal complaints of the upper extremity in musicians. A fourth important issue is the exclusion of confounding factors. As regression models were used to adjust for differences in age, gender, study grade, smoking, sport, alcohol consumption, body mass index, and hand preference, the effect of many important confounding factors was eliminated. At the same time, our study is important as it explores an issue which is clinically very relevant in this group of performing artists. In addition, our study may help to shed light on tailoring interventions—preventive coping strategies as well other medical interventions—to musicians' needs.

A surprising finding of the current study is the difference in the perception of “treatment control”. Musicians think that treatment for their musculoskeletal complaint(s) is more effective than medical students (nonmusicians). A hypothesis for the lower scores of the medical students on treatment control is the more extensive and probably more realistic knowledge of these students on the current treatment possibilities and outcomes of musculoskeletal complaints. Compared to patients in other studies, musicians' scores on treatment control are low [10, 24, 28, 29]. This is in line with the fact that musicians tend to consult more with

alternative practitioners than with traditionally trained providers, often because of a lack of trust of the medical establishment [30]. Musicians are frustrated by the absence of knowledge of medical care providers concerning the physical demands of playing their instrument and the lack of recognition of the importance of the occupation of the musician [31]. Are physicians unable to satisfy the high demands of the musicians? An exploration of the expectations of a patient is essential, especially when the treatment expectations are as high as in musicians.

The subjects in this study have complaints which vary from myalgia to invalidating pain. This is reflected in the relatively positive B-IPQ scores compared to other studies on patients with by example systemic lupus erythematosus (SLE), chronic obstructive pulmonary disease, lung cancer, and myocardial infarction [10, 12, 24, 29].

This study shows important differences in illness perceptions between music academy and medical students concerning their conceptualization of musculoskeletal complaints. Because of the known impact of perception on outcomes of treatments, doctors treating musicians should be aware of the substantial influence of cognitive and emotional aspects of an illness and coping style of their patients. Addressing these concerns, for example with a cognitive-behavioral technique such as motivational interviewing, may be more beneficial, and effective and efficient than a strictly biomedical approach. Intervention studies in patients with a myocardial infarction, pain, and SLE showed effectiveness of this approach in producing positive behavioral and psychological outcome [12, 16, 32]. Interaction between a patient and a healthcare provider stimulating interaction on expectations and beliefs about the complaint can reduce unhelpful perceptions, improve coping skills, and improve health and work outcomes [20] as well as surgical outcome [33, 34]. In conclusion, a biopsychosocial approach of musicians with musculoskeletal complaints appears to hold promise.



**Disclosures** None.

## Appendix: Questionnaire content

### Sociodemographic characteristics and general health

Age, gender, length, weight, right/left-handed, study year (bachelor 1 until 4, master 1 or 2), playing an instrument and study (music academy student/medical student), main instrument (violin, viola, cello, base, piano/keyboard, guitar/mandolin, bassoon, oboe, clarinet, flute/piccolo, horn, trombone, tuba, harp, percussion, recorder, and other in which the participants had to fill in their instrument) were asked. The instruments were divided in five categories: (1) bowed strings, (2) plucked strings, (3) woodwinds, (4) brass, and (5) percussion and keyboards. In addition, the questionnaire included questions concerning smoking (none/up to a half pack a day/half to one pack a day/more than one pack a day), alcohol (number of glasses per week), and sports (number of hours per week).

### Musculoskeletal complaints

Musculoskeletal complaints were comprehensively questioned, using a self-constructed questionnaire on musculoskeletal complaints consisting of 144 questions, in which the occurrence of complaints in six specific body regions, subdivided in 21 subbody regions (yes/no) was asked. Each of these groups of questions started by asking whether the individual had complaints about a specific body region during the last 12 months. The first body region “elbows, wrists and hands” was subdivided in six localizations (elbow left and right, wrist left and right, hand left and right). The second one “neck shoulders and upper back” was subdivided in four localizations (shoulders left and right, neck, upper back). The third region “lower back” was not subdivided, while the fourth region “hips and knees” was subdivided in four localizations (hip left and right and knee left and right). The fifth region “ankles and feet” was subdivided in four subregions (ankle left and right, foot left and right). The last region “jaw and mouth” was subdivided in jaw and mouth. The total prevalence score was calculated by adding all subjects with at least one complaint. The prevalence concerning a specific body region was also computed by adding all subjects with at least one complaint in that body region. If the above mentioned question concerning complaints during the last 12 months was answered with yes, it was specified: it was asked whether the complaint was still present (yes/no). Then again the question on whether there were more complaints of the same body region was asked. In case the question was answered with yes, this was again specified; otherwise the next body part was questioned.

For this study, only the data from respondents that indicated having had one or more musculoskeletal complaints over the past 12 months were used. For the assessment of illness perceptions, the Dutch version of the Brief IPQ was used [35].

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