

# An Occupational Study of Physical Playing-related Injuries in College Music Students

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**Abstract**—Several studies have been conducted on the playing-related physical injuries of college music students. In this study, a client-centered, occupation-based survey was administered to music majors at a large midwestern university. The primary objectives of the study were to examine which health professionals were consulted by this population, and to determine student satisfaction with any treatment they might have received. Secondary objectives included evaluating students' perceptions of the need for professionals with specialized knowledge of music and musicians, and examining the lifetime prevalence of playing-related injuries in this population. The survey response rate was 92.3% (108/117). Ninety-three respondents (87.7%) of 106 indicated that they had experienced playing-related injuries at some time in their lives. Forty-four percent of students who reported playing-related injuries had consulted health professionals (41/93), while only 24.7% had sought treatment from health professionals. Of the 93 students who reported a playing-related injury, 41.9% (39) had consulted either an occupational therapist, a physical therapist, or an athletic trainer, compared with 58.1% who had consulted other health care professionals listed in the questionnaire. 86.9% of the students were satisfied with the treatment they received, and those who felt better immediately after treatment were also more likely to feel better at the time of the study. The majority of the respondents (79%) felt that musical knowledge was important in health professionals who might treat their injuries. Occupational therapy, an allied health profession that has a holistic and client-centered treatment philosophy, is discussed in relation to the treatment of injuries in this population. *Med Probl Perform Art* 15:86–90, 2000.

College students have been the focus of several studies on musicians' playing-related physical injuries.<sup>1-6</sup> Some conclusions that have recurred in the literature are the prominence of injuries in piano and string players, and the higher incidence of injuries among females compared with males.<sup>1,4-6</sup> The majority of these studies focus on reporting prevalence, while less is known about which medical services are used for playing-related injuries. In addition, very little has been done

to address client satisfaction with treatment, or what needs or expectations students have for the treatment of playing-related injuries.

The primary objectives of the study were to examine which health professionals were consulted by this population, and to determine student satisfaction with any treatment they might have received. The secondary objectives were to determine: 1) the perceived need for professionals with specialized knowledge of music and treating musicians within this population, 2) students' satisfaction with currently available treatments, 3) needs and expectations with regard to consultation and treatment, and 4) lifetime prevalence of playing-related injuries in this population. The principal author's (CG) own college music training was used as a backdrop to understanding the participants' experiences in order to achieve these goals.

A particular focus of the study was conventional therapies, including occupational and physical therapy and athletic training of these therapies. Providers of these therapies use direct observation to assess activities that aggravate medical problems, perhaps more frequently than do other health professionals. In addition, occupational therapy has historically been awarded the upper extremity caseloads more frequently, and therefore may be more likely to observe playing activity in a clinical setting than other therapies. The principle of occupational therapy practice is that treatment in which the client is a fully active participant is more effective than treatment that is assigned to the patient.<sup>7</sup> It was therefore hypothesized by the researchers that students who see therapists as well as physicians for treatment would be more satisfied with their treatment than those who see only physicians. Other professions were also included in order to examine the breadth of professionals that college musicians rely on for medical care.

## METHODS

The three major instrumental ensembles at a large midwestern university were surveyed for this study. The study received prior approval from the Human Subjects Institutional Review Board at the institution, as well as face validation and approval by the director of the School of Music. Each ensemble director was approached prior to the survey, and a copy of the survey was provided if desired. A mutually convenient rehearsal time was chosen during the week of

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November 30 to December 4, 1998. The investigator (CG) briefly explained the objectives of the survey and the requirement that participants be nonvocal music majors, and personally distributed copies and pencils to the students. The survey took approximately 10 minutes to complete, and questionnaires were returned to the investigator prior to leaving the rehearsal. Participants were instructed not to indicate their names on the questionnaires and were assured of the confidentiality of any identifying information. The complete and incomplete surveys were then counted and numbered, and the response rate was calculated. Two surveys were not analyzed because the participants were non-music majors. Responses were then coded and analyzed using the Statistical Package for Social Sciences (SPSS; SPSS, Inc., Chicago, IL).

The questionnaire included three major sections. Section A addressed demographic information, including gender, academic status, age group, major, and principal instrument. Section B addressed the participants' treatment histories. Finally, section C addressed participants' perceptions about the effectiveness of treatment, and the importance of musical knowledge in a health professional who might treat them.

With regard to the primary objective of the study, a distinction was made between consultation and treatment by a health professional. In the authors' experience, many participants ask questions or see a professional once, or occasionally, rather than for prolonged, intensive treatment. The parameters defining the terms "consult" and "treat" in this context were not defined by the study; rather, two separate questions were asked, allowing the participants to make the distinction through their responses. These questions were "Have you *ever* consulted a health professional about a problem or concerns with playing your instrument?" and "Have you *ever* received treatment from a health professional for concerns about playing your instrument?"

Secondary goals were achieved as follows. Lifetime prevalence was addressed by a yes or no response to the question "Have you *ever* experienced any playing-related physical problems during or after playing your instrument?" Relationships between whether students had seen therapists or not, and their satisfaction with treatment they received were examined, as indicated by their responses on a Likert scale of 1 to 5 to the question "How satisfied were you with the treatment you received?" Scores of 1 indicated that participants were "not at all" satisfied, 3 indicated "somewhat" satisfied, and 5 indicated "very satisfied." Scores of 1 and 2, and 4 and 5, were grouped together for this correlation. Perceived efficacy of treatment was also examined, as indicated by a response to the questions "How much better were you *immediately* after treatment?" and "How much better are you *now*?" These two questions were designed to address the fact that a participant could have had treatment in the past, or could still be in treatment. Their responses to these questions were intended to give the investigators the necessary information to determine whether treatment was perceived to be effective in the long term.

Finally, the perceived need for specialized training in music and treating musicians was addressed by the question "Please rate how important musical knowledge is in a health profes-

**TABLE 1.** Distribution of Reported Problems by Instrumental Group

Instrument Group	Frequency	Reported Problems	% Problems in Group
Upper strings	23	23	100.0
Lower strings	9	7	77.8
Woodwinds	37	31	83.8
Brass	28	24	85.7
Percussion	9	8	88.9

sional who might treat your injuries." Again, a scale of 1 to 5 was used for this question. In addition, an open-ended question was included in order to allow participants to express any concerns that had not been addressed in the questionnaire. The question was "What would you want from a health professional who might treat you for musicians' injuries?"

## RESULTS

Pearson's chi-squared test was used in the analysis with the significance level set at 0.05. One hundred eight completed surveys were collected from 117 distributed, giving a response rate of 92.3%. Ninety-three of the 106 admissible respondents (87.7%) indicated that they had had these problems, while only 23 of these (24.7%) had actually sought treatment. However, 41 respondents (44.1%) indicated that they had consulted a health professional.

Demographic information about the participants was first examined. Of the students who responded, 41.9% (of a total 108 responses) were male, while 58.1% were female. This distribution corresponds to the School of Music's information about the gender split at the university. Fifty-six of 61 (91.8%) females and 36 of 44 (81.8%) males reported having had an injury at some point in their lives. Chi-square significance tests were calculated between gender and injury rates, but these were not found to be significant.

The importance of instrument type in determining injury rates was examined next. Frequencies are shown in Table 1. Instruments were grouped into classifications as upper strings (violin and viola), lower strings (cello and bass), woodwinds (flute, oboe, clarinet, saxophone, bassoon), brass (trumpet, trombone, tuba, horn), and percussion (percussion and piano). Piano was grouped with percussion in this study for simplicity, as there were only two respondents who were piano majors, and the difficulties experienced are in similar anatomic areas. This was cross-tabulated with a yes or no response to the same question as above. These results are shown in Table 1. All injury rates were high, but no significant difference was observed.

In order to gain a better understanding of the demographic distribution of injuries, students' majors and academic statuses were examined. Performance majors were compared with other majors to see whether they experienced a higher rate of injuries than other groups. There was no significant difference seen between performance majors and other majors in this study. A relationship between academic

**TABLE 2.** Frequency of Injuries by Academic Status Group

Academic Status	Frequency	Reported Problems	% Problems
Freshman	33	28	84.8
Sophomore	27	25	92.6
Junior	17	16	94.1
Senior	20	16	80.0
Graduate	9	8	88.9

**TABLE 3.** Frequency of Symptoms Reported by Students Who Experience Difficulties

Symptom	Frequency	% of Responses
Numbness or tingling	45	17.9
Unexplained bump	10	4.0
Weakness	38	15.1
Pain—sharp	40	15.9
Pain—ache	67	26.6
Pain—any other type	15	6.0
Other	37	14.7

**TABLE 4.** Importance of Musical Knowledge in a Health Professional Who Might Treat Your Injuries

Score	Frequency	% of Responses
1 (not at all important)	1	1.6
2	2	4.8
3 (somewhat important)	9	14.5
4	16	25.8
5 (very important)	33	53.2

status (freshman, sophomore, junior, senior, or graduate) was also examined. Interestingly, although no significant association was seen, the injury frequency increased with academic status until the senior year, at which point it decreased again. Sophomores and juniors had the highest rates of injuries, at 92.6% and 94.1%, respectively, while seniors had the lowest rate, at 80%. This is shown in Table 2.

A pattern appeared during the analysis of these data, which was subsequently examined for significance. The factor was the presence of pain as a symptom that participants had experienced, as indicated by a check in any of three available pain categories: pain—sharp; pain—ache; or pain—any other type. Of those participants who reported any physical playing-related problems, 77 (82.8%) reported pain symptoms. This represents 72.6% of the total sample population. Of the 23 participants who actually sought treatment for their problems, 22 experienced pain symptoms. This suggests pain is strongly associated with seeking treatment for injuries. Frequencies of symptoms reported by participants are shown in Table 3 (multiple responses were permitted in this question).

To address the objective of determining which health professionals the students were seeing, data from the 93 participants who reported injuries were used. The types of health pro-

fessionals whom students consulted for treatment were examined. Physical and occupational therapists and athletic trainers were grouped together as “therapists,” and compared with other professionals. Twenty-one of the 93 (22.6%) participants who indicated that they had problems saw therapists, while 72 of the 93 (77.4%) saw other professionals (multiple answers were possible in this question). Of the 21 who saw therapists, 17 (81%) had been asked about their playing, and seven (33.3%) had been asked about their playing and were observed while playing, for evaluation and treatment purposes.

Satisfaction with treatment and the relationship between satisfaction level and whether the students received treatment from a therapist were next examined. Scores on questions relating to how much better the participants perceived themselves to be immediately after treatment and at the time of the study were examined. Results showed a positive relationship between the two variables ( $\chi^2 = 0.828$ ,  $p < 0.05$ ). This indicates that the better students feel immediately after treatment, the better they will perceive themselves to be later on. No relationship was seen between the participants who saw therapists and their perceptions of how much better they were immediately after treatment or at the time of the study. There was also no relationship between seeing a therapist and patient satisfaction with treatment.

Finally, the students were asked how important musical knowledge was in health professionals who might treat their injuries. Seventy-nine percent of the 62 respondents (49/62) who answered this question rated health professionals’ musical knowledge as 4 or 5 on the five-point scale. Thirty-three participants (53.2%) indicated that musical knowledge was “very important.” These results are summarized in Table 4. Answers of “very important” were then cross-tabulated with answers to the questions addressing whether they had been asked about or observed playing. These answers were unrelated to the importance of musical knowledge. Correlational analysis was performed on the questions in section C of the survey, all of which had a Likert scale answer format. The variables of how much better students felt immediately after treatment, how much better they felt at the time of the survey, how satisfied students were with any treatment they received, and whether they felt that musical knowledge was important in a health professional who might treat their injuries were examined. The importance of musical knowledge in a health professional was not related to any other variables examined. These results are summarized in Table 5.

## DISCUSSION

This study demonstrated that college music students who sought treatment for physical difficulties they encountered as a result of their occupation were satisfied with the treatment they received from the professionals they saw. In addition, those who felt better after treatment also felt better at the time of the study. College music students in this study felt that musical knowledge in health professionals who might treat their injuries is important. There was a low response rate on this particular question, probably due to the structure of the survey itself. This question appeared on the last page,

**TABLE 5.** Correlational Analysis of Survey Questions from Part C: Treatment Preference

	How Much Better Were You after Treatment?	How Much Better Are You Now?	How Satisfied Were You with Treatment?	Importance of Musical Knowledge in a Health Professional
How much better were you after treatment?				
Pearson correlation		0.432*	0.397†	0.031
Significance (2-tailed)		0.005	0.012	0.847
n		41	39	41
How much better are you now?				
Pearson correlation	0.432*		0.392†	-0.117
Significance (2-tailed)	0.005		0.014	0.468
n	41		39	41
How satisfied were you with treatment?				
Pearson correlation	0.397†	0.392†		-0.154
Significance (2-tailed)	0.012	0.041		0.350
n	39	39		39
Importance of musical knowledge in a health professional				
Pearson correlation	0.031	-0.117	-0.154	
Significance (2-tailed)	0.847	0.468	0.350	
n	41	41	39	

\*Correlation is significant at the 0.01 level (two-tailed).

†Correlation is significant at the 0.05 level (two-tailed).

preceded by three questions relating to treatment. There were several participants who did not receive treatment who also did not answer this question. Future studies with similar questions should take care to direct students who have not sought treatment to answer all questions that apply to them.

Although no statistically significant association was found between satisfaction with treatment or perception of the effectiveness of the treatment and which health professionals were seen, there was a significant relationship between students who saw therapists (either occupational or physical therapists or athletic trainers) and those who were asked about or observed while playing their instrument for treatment purposes. Athletic trainers were included in this group because of the presence of the Sports Medicine Clinic on the campus, and the known fact that the health center at the university actively promotes this service for music and dance majors through advertisements in the student newspaper, and through referrals to the clinic. Both physical therapists and athletic trainers have the opportunity to treat musicians at this facility. Asking clients about their activities and observing these while in treatment are both modalities commonly used in all three professions, so the observed pattern is an expected outcome based on the philosophies of these professions.

Lifetime injury prevalence was determined by a yes or no response to the question, "Have you *ever* experienced any playing-related physical problems during or after playing your instrument?" Other studies have used medical documentation, symptoms, complaints, pain, and other methods to measure injury prevalence. In this study, however, the researchers were interested in the perceptions of the partici-

pants themselves about their experience with "playing-related physical problems." A "yes" response to this question was equated to injuries. However, it is possible that students may perceive "problems" and "injuries" differently. The intent of the question was to steer clear of diagnosing the problem, which was not the purpose of the study. Clarification of this potential discrepancy could be a goal of future work.

Two associations that were not substantiated by this study were a higher frequency of injuries among women and a higher frequency of injuries in upper string players (violin and viola). A higher prevalence of injury for these groups has been demonstrated in previous studies of college musicians,<sup>1,4-6</sup> but was not found to be significant in this study. However, since injury rates were high in all groups, it would be difficult to say whether this demonstrates a difference in this group, or whether these results deviate because the questions were different. This high prevalence of injury is likely due to the fact that this study examined lifetime prevalence, rather than rates at the specific time of the study. A larger sample size might be better able to indicate whether this relationship was present or not within this population, and within the parameters of the study.

An interesting result of this study was that of those who sought treatment, 95.7% had experienced pain symptoms as a result of playing their instruments. It could be speculated, therefore, that pain is the major symptom that directs a college music student to seek medical attention. This is troubling when compared with the 33% of participants who indicated that they had experienced numbness, tingling, or weakness, and did not seek treatment. It is also possible that

pain in a patient inspires a different response in the health professional, which may lead to treatment as differentiated from consultation in this study. More clarification on this relationship is needed in future studies. However, it is safe to suggest that more education about the severity of symptoms such as numbness and weakness in relation to musical performance could be beneficial to this population.

A wealth of research in musicians' injuries can be found in the literature, which represents many health professions. Few studies in this field, however, have been done by occupational therapists. Occupational therapy is described by the American Occupational Therapy Association as a "skilled treatment that helps individuals achieve independence in all facets of their lives."<sup>8</sup> Occupations are "self-initiated, self-directed activit[ies] that [are] productive for the person . . . and contribut[e] to others."<sup>9</sup> The profession is founded on the premise that occupations, those things that we as human beings do that occupy our time, space, and thoughts, are essential to health. Therapists act as "search engines' for potential"<sup>9</sup> for the clients they treat, rather than focusing on their limitations. Occupational therapy treatment is client-centered<sup>10</sup> and uses the partnership of the client and therapist to produce a result that makes the individual more satisfied with his or her roles in life. Being a college student musician is one of these roles. Certainly, if occupational therapists intend to treat college musicians, it is essential that they understand the occupational hazards encountered and the types of services desired by the population.

However, the information in this study is certainly not limited to occupational therapists. Many other health professions have embraced the concepts of client-centered treatment and direct observation of activities for assessment. Empathy and understanding for the patient are global concepts in health care that drive those who treat performing artists to assert that these artists are different, and need dif-

ferent care than other patients. As the client-centered approach becomes a global concept in health care, the information in this study could be essential not only to occupational therapists working in the area of musicians' injuries, but to all practitioners in the field of health care.

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