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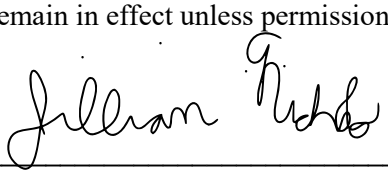
Signature:  **Date:** 05/01/2022

Exploring the Impact of Performance-Related Injuries in Collegiate Instrumental Musicians and Occupational Engagement

By

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Review of the Literature

Introduction

The art of instrumental music is an expression not solely composed of the creative study of acoustics and frequencies, but also includes the science of particular body mechanics which allow musicians to participate in this most sensational experience (Guptill, 2011). To be a musician requires a creative heart, a curious brain, and also very often calloused fingers and mightily strong fine motor muscles. Instrumental musicians have been coined as "fine motor athletes," due to the intense impact this occupation has on the body (Roos et al., 2021). Musicians practice countless hours to perfect their craft, often taxing the delicate tendons, ligaments, muscles, and joints which make playing an instrument possible. Many studies have explored the nature of such performance-related musculoskeletal disorders, including the types of injuries, types of rehabilitative interventions, and preventative strategies within the context of instrumental musicians (Kok et al., 2015). Understanding the specific biomechanics various instrument families require helps music performers, music educators, physicians, physical therapists, and occupational therapists to prevent damage to these important body structures and intervene upon injury (Chan et al., 2013a). This paper will analyze the current findings across multiple studies pertaining to musculoskeletal injuries in musicians and identify gaps in the literature in understanding the impact of such occupational injuries from a more holistic perspective.

Prevalence of Performance-Related Musculoskeletal Disorders in Musicians

In the past few decades, much research has emerged discussing the prevalence of injuries experienced by instrumental musicians. In 1998, one of the first systematic reviews on this topic was conducted (Zaza, 1998). This study recognized a major barrier in understanding the

prevalence and risk factors of injuries experienced by musicians is a lack of a clear definition in the literature when discussing injuries which arise as a result of playing an instrument (Zaza, 1998). The author therefore coined the term "playing-related musculoskeletal disorders" (PRMD) as a way to differentiate injuries caused from overuse and those experienced by musicians not related to playing an instrument (Zaza, 1998). This systematic review has been noted to be foundational in the study of musculoskeletal disorders experienced by instrumental musicians as the body of literature relating to PRMD prevalence has expanded over the past several decades (Kok et al., 2015).

In 2015, another systematic review was conducted to investigate the prevalence of musculoskeletal issues among instrumental musicians (Kok et al., 2015). According to this review, recent literature has found a lifetime prevalence of playing-related musculoskeletal conditions to be between 62-93% (Kok et al., 2015). This is significant, as it shows across multiple peer-reviewed studies, the vast majority of all musicians will experience an injury related to the occupation of playing their instrument (Kok et al., 2015). This review also found that across multiple studies, there is a significantly higher prevalence of musculoskeletal conditions in female instrumentalists in comparison to males, though both female and male musicians experience a significantly higher rates of musculoskeletal disorders than the general public (Kok et al., 2015).

In 2016, a systematic review was conducted to identify common risk-factors regarding musculoskeletal disorders in musicians (Baadjou et al., 2016). This review examined several risk-factors across many studies including physical, psychosocial, and work-related conditions (Baadjou et al., 2016). An interesting link was noted in the prevalence of performance anxiety in musicians as being a positive correlator to PRMDs (Baadjou et al., 2016). Another commonality

seen in the literature according to this review is the prevalence of PRMDs specifically in musicians who play instruments classified as upper strings (violin and viola), as compared to other instrumentalists (Baadjou et al., 2016). This finding has been echoed in a systematic review conducted in 2020, finding string players to be nearly three times more likely than woodwind players to experience pain in the wrist or hand (Rotter et al., 2020). Additional risk factors for injury across multiple studies include arm positioning, the weight of an instrument, and the amount of hours played per week (Rotter et al., 2020). The asymmetrical positioning required to play many instruments may cause tightness and overuse of certain muscle groups, while underuse and weakening of other muscles, causing an imbalance of tone and tightness between limbs (Yang et al., 2021). Furthermore, changes in routine, the demands of approaching performances, and overall physical fitness are contributors to the development of PRMDs (Yang et al., 2021). The competitive culture of the music world may also be contributing substantially to the prevalence of injuries seen among professional musicians (Horvath, 2010). Performance anxiety is also highly correlated to the prevalence of PRMDs, as one study showed musician's with performance anxiety were 1.4 - 2.9 times more likely to develop a playing-related injury (Steinmetz et al., 2014). The demands of specific pieces of repertoire, the fast-pace of the industry, fear of losing one's source of income, intense standards and expectations, and external stressors are all noted among musicians as having contributed to performance-related injuries (Horvath, 2010).

There are also many risk factors pertaining to the unique ergonomic demands of each instrument type that are important to consider in determining the prevalence and types of injuries experienced by a diverse range of musicians (Yang et al., 2021). For example, among piano players in particular, there exists many risk-factors for overuse conditions including having small

hand musculature, being older in age, being a woman, and having heightened levels of anxiety and stress (Yang et al., 2021). The most common conditions seen among pianists include muscle contractures, trigger finger, and strain to the carpal tunnel region of the wrist (Yang et al., 2021). Among violinists, the most common regions of the body affected by playing are the upper extremities, neck, and shoulder (Yang et al., 2021). Because of the asymmetric form required of the instrument in which the violin rests on the left side of the body, players often develop a bilateral imbalance of tone, resulting in weakness in some areas and strain in others (Yang et al., 2021). A common condition seen due prolonged performance posture in violinists is scapular dyskinesis (Yang et al., 2021). Because of the way the violin rests on the left shoulder, proper ergonomic positioning of the chinrest and shoulder pad are crucial in preventing injuries to the neck and shoulder (Palac, 2012).

The injuries seen in percussionists vary greatly from those seen in violinists and string instruments (Yang et al., 2021). Many percussive instruments require the use of mallets and drumsticks to strike a drumhead or keyboard, and the force of such repetitive striking places significant stress upon the tendons of the hands and wrists (Yang et al., 2021). Over time, this leads to a significant number of hand and wrist conditions including tenosynovitis, carpal tunnel syndrome, and tendonitis of the wrist (Yang et al., 2021).

In contrast, brass and woodwind instrument players experience a much higher risk for developing musculoskeletal disorders and injuries related to the jaw, due to the embouchure of the facial muscles required to play wind instruments (Steinmetz et al., 2014). Woodwind players are also at higher risk of experiencing pain in the neck region in comparison to other instrumental groups (Leaver et al., 2011). Additionally, because many woodwind instruments

rest on the thumb of one hand, woodwind players also are at higher risk of injury to the tendons and muscles of the wrist and thumb (Yang et al., 2021).

Prevention and Intervention Methods

The diverse range of body regions affected among varying types of instrumental musicians has led to a multitude of studies investigating various types of injury prevention and intervention techniques for music students and professionals. Certain methods of injury prevention can be generalized across many instrument types (Yang et al., 2021). The structure of practice sessions can also reduce fatigue and overuse injuries among all types of musicians (Dawson, 2006). Organizing practice routines to include breaks in between sessions, such as alternating playing for twenty-five minutes, followed by a five minute break may greatly reduce propensity of fatigue for music students (Dawson, 2006). Additionally, breaking up practice sessions using techniques such as mental practicing and singing are techniques that can be used to lessen strain on the body during long practice sessions (Yang et al., 2021). Warming-up the muscles prior to playing is suggested for all musician types as a way to increase circulation and decrease risk of musculoskeletal injury (Yang et al., 2021). Musicians can achieve this by making large arm movements and stretching prior to practice sessions (Yang et al., 2021).

In addition to stretching prior to rehearsal, some studies have investigated the benefit of exercise and overall fitness to reducing playing-related injuries (Chan et al., 2013b). One study which looked at the effects of implementing a DVD exercise routine for professional orchestral musicians found those who completed the exercise intervention experienced significantly less pain at the end of the study than those in the control group who did not participate in the DVD exercise program (Chan et al., 2013b). The positive effect of exercise on reducing PRMDs has been seen in young musicians as well (Nawrocka et al., 2014). A study conducted in Poland

among music students between the ages of 10-18 examined the correlation between students who exercised for at least 60 minutes per day on average in addition to their musical studies reported substantially less playing-related pain than those students who did not engage in physical activity on a regular basis (Nawrocka et al., 2014).

Music educators can play a significant role in the reduction of playing related injuries in developing musicians (Guptill, 2011). Because music teachers influence the development of proper technique, posture, and playing habits, it is important that educators emphasize the importance of musicians' health as a regular part of their curriculum (Guptill, 2011). When music educators place unrealistic expectations upon students to practice for excessive hours each day without intentionally instructing injury prevention techniques, students may feel pressured to push themselves to unhealthy limits (Guptill, 2011). Music students have expressed these pressures as being detrimental to both their physical and psychological well-being (Guptill, 2011). Further, music students at the collegiate level have expressed feeling music institutions do not provide sufficient resources or education about musicians' health and injury prevention as a regular part of their learning (Rickert et al., 2015). Studies examining the perceptions of health and playing-related injuries among college students have revealed the majority of music students believe that injury prevention techniques should be a regular and mandated component of music education (Stanhope, 2018). Providing music students at the collegiate level with courses pertaining to health and wellness may be an effective way of promoting healthy playing habits and preventing PRMDs later in musicians' careers (Stanhope, 2018).

Perceptions and Beliefs Among Musicians

In understanding the effects of playing-related musculoskeletal disorders on musicians' lives, it is important to gain their perspectives on PRMDs. One study investigating the

perceptions and beliefs about PRMDs among professional musicians describes a “culture of silence” which exists among the profession regarding injuries (Guptill, 2011, p. 275). This study, which consisted of focus groups and interviews of self-identified professional musicians who had experienced a playing-related injury, found there is significant stigma surrounding PRMDs among professional musicians (Guptill, 2011). Musicians describe this stigma originating from the pressures of the arts not always being recognized among other professional groups as being a legitimate way of making a living, or being a “real job” (Guptill, 2011, p. 274). Furthermore, because of how competitive the music industry is, musicians fear disclosing information about injuries to employers or coworkers may deem them less hireable and lead to security job insecurity (Guptill, 2011). Because many professional musicians are freelance workers, their ability to play their instruments is often a matter of whether or not they will have money for food, housing, and other vital expenses, so many musicians describe a need to “*play through the pain*” in order to make a living doing what they love (Guptill, 2011,). This ideal is seen even among younger music students, who may feel pressured by strict teachers or parents to practice for excessive hours in order to stay on a path towards a successful music career (Guptill, 2011). In a study which compared the perceptions of playing-related injuries among university music students and professional musicians, researchers uncovered a common belief among students that pain is merely an expected and necessary experience for becoming a professional (Rickert et al., 2015). These same attitudes appeared in a study investigating the experiences of students at a music institution in Australia, where string students expressed playing-related pain as being an anticipated factor in achieving professional status (Waters, 2019).

The attitude of “playing through the pain” is echoed in a number of studies, including one by Wilson et al. (2014) describing the experiences of traditional Irish musicians and PRMDs .

This study, which consisted of focus groups of professional musicians, found several themes relating to the experiences of injury in this population (Wilson et al., 2014). The first and most prominent theme found in this study was that of "fear" associated with both acquiring and admitting to having acquired a PRMD (Wilson et al., 2014). Because the occupation of playing an instrument for so many musicians is not only a source of income but is also their sense of livelihood and primary outlet of self-expression, musicians fear PRMDs will cause a loss of identity as an artist (Wilson et al., 2014). This perpetuates a "culture of denial" which is described by musicians in this study, as instrumentalists are expected to rise above the pain in order to remain being seen as a legitimate professional in the field (Wilson et al., 2014). Participants of this study also describe a sense of reverence and respect for musical compositions so intense that many are willing to play through the pain purely to show their dedication to the artform (Wilson et al., 2014).

Participants of a qualitative, phenomenological study conducted in 2021 parallel many similar themes regarding a culture of "fear" and "shame" (Roos et al., 2021). In this study, the authors describe the use of a common phrase quoted often among musicians being "No pain, No gain," which articulates the principle that playing through pain is good and essential to "making it" in the professional industry (Roos et al., 2021). The authors describe the unique culture among musicians, what is often colloquially referred to as "the music world", in which musicians perpetuate beliefs that continuing to practice and perform despite experiencing pain is indicative of a determined, dedicated artist (Roos et al., 2021). Because of these cultural underpinnings, many instrumentalists describe a fear of being seen as "incompetent" or "weak" among their professional peers and employers if they are unable to persist through the pain of an injury (Roos

et al., 2021). Such beliefs often lead to detrimental consequences, including musicians playing through painful injuries until they are absolutely unable to continue (Roos et al., 2021).

Another common theme found in the literature regarding musicians perceptions of playing-related injuries is a mistrust in the healthcare industry regarding the specific needs of treating musicians (Wilson et al., 2014). According to one study, musicians expressed hesitancy to visit doctors out of fear that they will not receive the treatment that they need (Wilson et al., 2014). Moreover, some instrumentalists fear that going to a healthcare professional to receive treatment for playing-related pain might cause "more harm than good" (Wilson et al., 2014). Because musicians rely on their ability to play in order to get paid for their work, some injured musicians may refrain from visiting doctors out of fear they will be told to stop playing altogether, which may cost them their primary source income and overall sense of livelihood (Stanhope, 2018). Other studies found similar beliefs that musicians believe there is a lack of qualified health professionals that are knowledgeable about the unique needs of musicians' health to properly treat their needs (Guptill, 2011). According to one study, 62% of music student participants at a university expressed that healthcare professionals need to be more knowledgeable about the specific needs of musicians' health in order to properly treat conditions related to performance injuries (Stanhope, 2018). Seeking quality healthcare may also be difficult due a lack of knowledge on how to locate specialty personnel who are knowledgeable about music-related injuries (Stanhope, 2018). Additionally, because a large portion of musicians work as freelance artists and do not receive healthcare benefits through an employer, many feel there is a gap in access to specialists for treatment for those musicians who do not have high-end healthcare benefits (Guptill, 2011). Thus, it is important that specialty healthcare become more

accessible to those who may not be able to readily afford treatment, especially since their careers are so highly dependent upon proper care (Guptill, 2011).

A study which researched the effects of having an "onsite" physical therapist present at professional orchestra rehearsals in Australia showed musicians were receptive to care when it was made available in such an accessible way (Chan et al., 2013a). The authors of this study compare the need for having trained medical personnel on staff in professional orchestra settings as being similar to athletes in sports having the opportunity to see an athletic trainer or physical therapist during games and practices should they need assistance (Chan et al., 2013a). Moreover, because the services provided in the study were free and available to musicians during breaks in rehearsals, this allows for more preventative treatment and immediate treatment of concerns which might otherwise remain unaddressed for a substantial length of time (Chan et al., 2013a). Even with the success of the trial, however, musicians expressed a desire to have more treatment from professionals in the form of longer and more frequent sessions, and for more healthcare professionals to be knowledgeable about the unique demands of each instrument (Chan et al., 2013a). Thus, the authors suggest further research focus on increased education for healthcare professionals such as physical and occupational therapists towards the specific needs of this population (Chan et al., 2013a).

An Occupational Therapy Lens

The concerns expressed among many musicians regarding accessibility and quality of care in receiving healthcare services for music-related injuries is evident of a major gap in both the literature and treatment of playing-related injuries. Despite an array of rehabilitation techniques and prevention strategies found in the literature, healthcare professionals appear to still be missing the mark on addressing musicians from a holistic and well-informed perspective

(Guptill et al., 2005). An occupational therapist and researcher on musicians' health, Guptill (2005), reports that music students feel they would benefit from healthcare professionals who take the time to collaborate with musicians to understand the precise demands of their instruments, music literature, playing environment, and practice habits in order to fully understand the extent of their injury . Some occupational therapists have identified how the holistic framework of occupational therapy aligns with the healthcare needs expressed by many musicians (Ting & Rocker, 2019). Occupational therapists value the integration of meaningful occupations in the intervention process of treating clients, and would encourage musicians to bring their instruments along to therapy sessions in order to get the most comprehensive view of the activity and its demands (Ting & Rocker, 2019). Occupational therapists can also gain the trust of musicians who may be fearful of seeking treatment by providing education about instrument modifications and practice adaptations that can be incorporated into routines to minimize risk of injury and promote sustainable, healthy playing for long-term success in their beloved profession (Ting & Rocker, 2019). Still, researchers have identified a need to further investigate the unique contributions occupational therapy has to offer, as there are known gaps in the literature regarding an occupational therapy focus on musician's health (Villas et al., 2020). Occupational therapists can offer musicians a holistic, client-centered approach to caring for their injuries to promote health literacy among music educators, students, and professionals, provide preventative care, and intervention techniques for those musicians who acquire playing-related injuries (Ting & Rocker, 2019). Occupational therapists can begin a holistic approach to treatment using an occupational profile to better understand the individual needs, values, and goals for each client (AOTA, 2021). The American Occupational Therapy Association recommends the use of occupational profiles as a standard practice in the evaluation process of

all clients (AOTA, 2021). The template provided by the organization is meant to examine a thorough composite of an individual's occupations and roles to help the occupational therapist better understand a client's values, routines, interests, and goals (AOTA, 2021). The use of an occupational profile in addressing musician's health and playing-related injuries can provide key insights into the ways in which playing-related musculoskeletal disorders are affecting musicians participation in multiple areas of their life.

Problem Statement

Musicians, like all humans, are occupational beings, and while much of their identity, community, and life meaning is derived from their artwork, musicians must also balance necessary activities of daily living (ADLs), instrumental activities of daily living (IADLs), and other leisure or professional activities. Thus, injuries that result from music practice and performance affect the entire person, and treatment and prevention strategies must be mindful of the demands of any other activity a musician engages in throughout their day which may hinder or facilitate healthy performance habits. We do not fully understand how injuries or prevention are affecting occupations in multiple domains of a musician's life including participation in social roles, household management, self-care, and other meaningful leisure activities. Thus, an exploration of the effects of performance-related injuries on occupational engagement and identity across all aspects of personhood may better allow healthcare practitioners to assess, treat, and prevent performance-related injuries.

Methods

The methods utilized to gather data for this research project included semi-structured interviews. Participants were recruited using convenience sampling. All participants were music majors recruited from the music department at Elizabethtown College. A total of seven

participants were interviewed for this project. All participants received, signed, and returned an Informed Consent Form and agreed to have their interview recorded. Interview questions were based on the American Occupational Therapy Association's (AOTA) Occupational Profile Template (AOTA, 2021). This template was used in order to gather information regarding each participant's occupational history, values, performance patterns, supports and barriers, and occupational engagement. Additional interview questions were supplemented to ask participants about their experiences specific to being an instrumental musician. The AOTA Occupational Profile Template as well as supplemental questions can be found in the appendix. All interviews took place via zoom and were recorded. After interviews were complete, an artificial intelligence transcription software called Otter.ai was utilized to transcribe each interview. Interviews were then edited by hand by the interviewer to correct any errors in transcription. The transcripts were de-identified and then were compared and analyzed by the interviewer to find commonalities between them. Similarities among the interviews were identified, highlighted, and charted by the interviewer.

Results

Participants ranged from first-year students to seniors, and were all music majors. Every participant had experienced some injury or disability that affected their playing, while only 5/7 were specifically performance related injuries acquired from instrumental performance and overuse. The most common injury types and body structures affected included the wrist, hands, fingers, and back. Some participants had formal diagnoses of carpal tunnel, while others had not received a diagnosis from a medical professional. Interviews were based on the AOTA's occupational profile template in order to gain a holistic understanding of the participant's

affected body structures, occupational history, supports, barriers, values, performance patterns, and occupational engagement.

Table 1 describes the primary instrument, specific major in the field of music, year in school, performance-related injury experience, and body structures affected of each participant in the study:

Table 1

Participant Number	**Primary Instrument**	**Major**	**Year in School**	**Has experienced a Performance Related Injury**	**Body Structures Affected**
Participant #1	Percussion	Music Therapy	Junior	Yes	Wrist
Participant #2	Clarinet	Music Therapy	Sophomore	Yes	Wrist
Participant #3	Piano	Music Therapy	First-Year	No*	N/A
Participant #4	Flute	Bachelor of Arts and Music	Senior	No**	Wrist
Participant #5	Clarinet	Music Education	Sophomore	Yes	Wrist
Participant #6	Flute	Music Education	Sophomore	Yes	Back
Participant #7	Clarinet	Music Education	Senior	Yes	Wrist, hand

*Participant has congenital physical disabilities not performance-related that affects their music playing

**Participant has an acquired injury not performance-related that affects their music playing

As per the AOTA's occupational profile template, participants were asked about perceived supports and barriers of their roles and occupations. Family members, professors, friends, and peer musicians were commonly stated as supports among participants. Workload, time management, and mental health were identified as commonalities for barriers among participants. Table 2 contains samples of direct quotes from interviewees:

Table 2:

Participant #	Supports	Barriers
Participant #1	"Friends, and peers, definitely the faculty, they're very understanding with everything, and they try to help me out."	We're encouraged to practice every day. We're not really supposed to stop, like, if you stop that stops the flow of getting better.
Participant #2	"Definitely the professors, they really, really want us to… succeed, and they want to watch us succeed"	"The workload is definitely intense… I do probably 24 hours worth of homework on weekends…I'm constantly doing homework. And like, there's been times when I've been so stressed and it affects my playing, and, like, the quality of playing goes down."
Participant #4	"Music itself supports… I find that I go to play piano or guitar when I'm really overwhelmed. And just like feeling the vibrations calms me down."	"Mental health concerns are definitely our barrier… Yeah, there are some days when like, my anxiety is so bad I can, like, barely do anything."
Participant #7	"Our faculty are the most supportive. I mean, they're, they are so willing, and wanting to get to know you on a more personal basis."	"The biggest thing is time. Yeah. Because we have deadlines…If you have an injury, it's like you, you don't have the time to deal with that."

Each participant also shared some of their personal values. Table 3 depicts some of the commonalities between discussed values.

Table 3:

Participant #'s	Value
Participant #1, #3, #5, #6	Compassion, empathy
Participant #1	Time
Participant #1	Positivity
Participant #2, #6, #7	Hard work, dedication
Participant #4, #6	Community
Participant #5	Spirituality/Faith

Participants were also asked the question "What does being a musician mean to you?" The following are their responses describing musicianship and identity.

Table 4:

Participant #	"What does being a musician mean to you?"
Participant #1	"Music has definitely gotten me through life in general…I think it brings people together. I think it's people's escape for things and it was definitely my escape. I always say when words fail, music speaks. So when words can't explain how you feel, I'd say music can explain how you feel."
Participant #2	"Music is a way to express and like, share emotions with others. I'm mostly interested in what I can do for others with music, being music therapists, like, I get to use it to help somebody else. And like, benefit somebody else with my music."

Participant #3	“Being a musician means a sense of community”
Participant #4	“Music is like everything to me. Like it's my passion…It's just like what I meant to do. I love it. And I love performing. And I love sharing my love of music with people.”
Participant #5	“I love being a musician. Because like, you can be expressive and you can make and bring somebody else.”
Participant #6	It's a very disciplined profession. I have to be very disciplined, I do. I have to practice every day to keep up my progress.
Participant #7	“Everything, that's my livelihood…Music was something that was there for me… at a hard point in time in my life. And so it's one of those things where I have really devoted myself to…I could not see myself doing anything else.”

Regarding the impact of performance-related injuries on occupations aside from music, participants responded with the following as seen in Table 5:

Table 5:

Participant #	**Impact of Injury on Occupations**	**Occupation Type**
Participant #1	“I play games on my PC and I have a really hard time doing that”	Leisure
Participant #2	“Mainly when taking notes… like sometimes it gets stiff. And like after practicing, like, lately, I've noticed if I'm like, carrying my water bottle…it'll be like a little painful.”	Education; IADLs
Participant #3	“Just like carrying things with	IADLs

	the brace on is like awkward…. My wrist isn't as strong.	
Participant #4	"When I'm cooking"	ADLs; leisure
Participant #6	"Yeah 100% I do really struggle like bending from my back to pick things up. And I don't carry a backpack anymore for that specific reason, I have a bag… But some days, like bending is pretty much a no go for me. Because it just causes too much pain." "I have had instances where, like my entire back is kind of seized up and I can't attend class. So I'm missing, like valuable instruction time. And I can't do certain things with my friends that are like, intensive in those muscle groups"	IADLs; education; social participation
Participant #7	"I actually have college documentation that I can use technology for any written assignment because…when I hurt my hand so bad, I could not write like, it was just absolutely painful"	Education

To gain a better understanding of how collegiate music students viewed health professionals, participants were asked the question "What is something that you wish health care

professionals understood better about being a musician?" Table 6 depicts a selection of their responses:

Table 6:

Participant #	"What is something that you wish health care professionals understood better about being a musician?"
Participant #1	"Sometimes stopping for as long as is asked, or just stopping in general, is not always an option."
Participant #2	"I wish they understood that like, especially as college students we are expected to practice 10 hours a week….. Just knowing how much we have to practice it, how much effort we have to put into it, and why, …we have to be able to practice"
Participant #5	"Honestly, like, the whole entire, like the 'physicalness', of being a musician, if that makes sense? …If you don't play clarinet, you don't necessarily understand how, like, holding a clarinet might affect different muscles"
Participant #6	"I kind of just wish they did understand that we do use, like, the select group of muscles that we have to use to make music, just as intensely as an athlete has to use their muscles to play their sport..... Like maybe if they just listened a little more."

Finally, participants were asked "What would it mean to you if music schools had more support for musicians' health?" This question was clarified with examples of workshops on injury prevention and classes on musicians' health. The following quotes highlight their responses:

Participant #	"What would it mean to you if music schools had more support for musicians' health?"
Participant #4	"I think that would actually be a really good idea... And also, if they could provide like, stuff you could do preventatively, that would be nice
Participant #5	"I think that would be really cool. And that's really something I've never heard of, so I would be super interested in it and excited to see it."
Participant #6	"I would absolutely love the idea of having more workshops related to injury care, just because injuries are a natural part of life. And it's very important to know how to take care of those, so you don't injure yourself further."
Participant #7	"Genuinely think I would start crying, like, literally musicians are some of the unhealthiest people…most of us are [practicing] until three in the morning…And we build these unhealthy habits, but we don't have the time, or the energy or know how to fix what we're doing."

Discussion

The results of this study reveal several key points regarding the experiences of performance-related injuries among collegiate level musicians. As evident by the participants' responses, performance-related injuries affect musicians' participation in multiple areas of their life including ADLs, leisure activities, and perception of self/identity. Participants of this study exemplify how the occupation of being a musician is so much more than simply playing an instrument, but it is central to their identity. For these collegiate musicians, music is both a career path, and their outlet for creative expression. It is just as much their community as it is their individuality.

Occupational therapists can play a key role in preventive and rehabilitative care for musicians. Because the occupational therapy practice framework describes habits, roles, and

routines to be well-within our scope of practice, occupational therapists are highly qualified to be addressing musician's health, both preventatively and in rehabilitation (AOTA, 2020). Occupational therapists view individuals holistically, and have a complex appreciation of how occupational engagement must be examined in the context of one's environment, performance patterns, performance skills, and person factors in order to fully understand one's needs.

Additionally, occupational therapists value the integration of meaningful occupations in the intervention process of treating clients, and would encourage musicians to bring their instruments along to therapy sessions, or observe musicians in a natural performance context, in order to complete an activity analysis and get the most comprehensive view of the ergonomic and musculoskeletal demands of their instrument. Furthermore, because occupational therapists understand just how significant an occupation is to one's livelihood and identity, occupational therapists can also gain the trust of musicians who may be fearful of seeking treatment. Occupational therapists can provide education about instrument modifications and practice adaptations that can be incorporated into routines to minimize risk of injury and promote sustainable, healthy playing for long-term success in their beloved profession. Occupational therapists can also help to bridge the gap in providing education to other healthcare providers such as primary care doctors, orthopedic specialists, physical therapists, and hand therapists about the unique needs of musicians and provide recommendations for treatment options and preventative care.

Finally, the findings from this study support the claim that music departments, especially at the collegiate level, may want to consider incorporating classes and workshops on musicians' health and injury prevention as a curricular requirement. I propose that occupational therapists can play an integral role as members of a music department to address the needs of musicians

and provide education on injury prevention, just as it is expected that an athletic department be required to have an athletic trainer on-site to treat athletes. Musicians are as dynamic as the music that they play, and their academic environments should consider how to provide resources for music students to take care of the instrument that matters most: their bodies.

Limitations

Limitations for this study include a small sample size and that responses reflect experiences from a small-liberal arts college and therefore may not be generalizable to broader populations.

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Appendix A:

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AOTA Occupational Profile Template

"The occupational profile is a summary of a client's (person's, group's, or population's) occupational history and experiences, patterns of daily living, interests, values, needs, and relevant contexts" (AOTA, 2020, p. 21). The information is obtained from the client's perspective through both formal and informal interview techniques and conversation.

The information obtained through the occupational profile contributes to a client-focused approach in the evaluation, intervention planning, intervention implementation, and discharge planning stages. Each item below should be addressed to complete the occupational profile. Page numbers are provided to reference a description in the *OTPF-4*.

American Occupational Therapy Association. (2020). Occupational Therapy Practice Framework: Domain and Process (4th ed). *American Journal of Occupational Therapy, 74* (Suppl. 2), 7412410010. https://doi.org/10.5014/ajot2020.74S2001

OCCUPATIONAL PROFILE			
Client Report	**Reason the client is seeking service and concerns related to engagement in occupations (p. 16)**	Why is the client seeking services, and what are the client's current concerns relative to engaging in occupations and in daily life activities? (This may include the client's general health status.)	
	Occupations in which the client is successful and barriers impacting success (p. 16)	In what occupations does the client feel successful, and what barriers are affecting their success in desired occupations?	
	Occupational history (p. 16)	What is the client's occupational history (i.e., life experiences)?	
	Personal interests and values (p. 16)	What are the client's values and interests?	
Contexts		What aspects of their contexts (environmental and personal factors) does the client see as supporting engagement in desired occupations, and what aspects are inhibiting engagement?	
	Environment (p. 36) (e.g., natural environment and human-made changes, products and technology, support and relationships, attitudes, services, systems and policies, etc.)	Supporting Engagement	Inhibiting Engagement
	Personal (p. 40) (e.g., age, sexual orientation, gender identity, race and ethnicity, cultural identification, social background, upbringing, psychological assets, education, lifestyle, etc.)	Supporting Engagement	Inhibiting Engagement

Performance Patterns	**Performance patterns (p. 41) (e.g., habits, routines, roles, rituals)**	What are the client's patterns of engagement in occupations, and how have they changed over time? What are the client's daily life roles? (Patterns can support or hinder occupational performance.)	
Client Factors		What client factors does the client see as supporting engagement in desired occupations, and what aspects are inhibiting engagement (e.g., pain, active symptoms)?	
	Values, beliefs, spirituality (p. 51)	Supporting Engagement	Inhibiting Engagement
	Body functions (p. 51) (e.g., mental, sensory, neuromusculoskeletal and movement related, cardiovascular functions, etc.)	Supporting Engagement	Inhibiting Engagement
	Body structures (p. 54) (e.g., structures of the nervous system, eyes and ears, related to movement, etc.)	Supporting Engagement	Inhibiting Engagement
Client Goals	**Client's priorities and desired targeted outcomes (p. 65)**	What are the client's priorities and desired targeted outcomes related to the items below?	
		Occupational Performance	
		Prevention	
		Health and Wellness	
		Quality of Life	
		Participation	
		Role Competence	
		Well-Being	
		Occupational Justice	

Additional Resources

For a complete description of each component and examples of each, refer to the *Occupational Therapy Practice Framework: Domain and Process, 4th Edition.*

American Occupational Therapy Association. (2020). Occupational therapy practice framework: Domain and process (4th ed.). *American Journal of Occupational Therapy, 74* (Suppl. 2), 7412410010. https://doi.org/10.5014/ajot2020.74S2001

The occupational profile is a requirement of the *CPT*® occupational therapy evaluation codes as of January 1, 2017. For more information visit www.aota.org/coding.