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BSc (Physiotherapy)

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The Prevalence of Playing-Related Musculoskeletal Disorders to the Upper Limb in Student Guitar Players

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2.3 Authors Declaration

Please include the following statement (signed) on a separate page after the title page with your manuscript

I, the undersigned declare that this project which I am submitting is all my own work and that the data presented is authentic.

_________________________ (Printed Name)

_________________________ (Signature)

Date / /
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Abstract

Title: The Prevalence of Playing-Related Musculoskeletal Disorders to the Upper Limb in Student Guitar Players.

Authors: Darren Scully and Neasa De Burca MISCP.

Background: Interest in playing-related musculoskeletal disorders (PRMDs) has been stimulated in the last thirty years. Physiotherapists are beginning to see increasing cases of PRMDs. PRMD prevalence in musicians has been reviewed in current research but there is a lack of evidence pertaining to PRMD prevalence in the use of a certain single instrument.

Objectives: The primary aim of this study was to determine the prevalence of PRMDs to the upper limb in third-level student guitar players, and the most affected upper limb location. Secondary aims were to assess the relationship between the occurrence of PRMDs and gender, age, length of time learning guitar, and weekly practice time.

Methods: A questionnaire of original design was created using Survey Monkey. 244 students from the University of Limerick were recruited by e-mail to complete it.

Results: PRMD prevalence in third-level student guitar players was found to be 40.98%. Females (49.12%) were more affected than males (38.50%). However, this was statistically insignificant (p = 0.17). The most affected location was the finger. No significant relationship was found between years learning the guitar and PRMD development.

Conclusion: The PRMD prevalence in this sample was within the previously reported range. No previous risk factors were shown to be of statistical significance. Further research should continue looking at PRMDs in other instruments in isolation.

Keywords: PRMD, prevalence, musician, guitar.
1. Introduction

A playing-related musculoskeletal disorder (PRMD) was defined by Zaza et al (1998) as a single question that could be used to determine whether a musician had a PRMD or not. It was phrased as follows: “Do you have pain, weakness, lack of control, numbness, tingling, or other symptoms that interfere with your ability to play your instrument at the level you are accustomed to?” PRMDS can present themselves as specific diagnoses such as shoulder impingement, ligament sprain, tendinitis, thoracic outlet syndrome, carpal tunnel syndrome and focal dystonia to name but a few, or non-specific diagnoses such as regional pain syndrome (Lederman, 2003). In previous studies, prevalence rates of PRMDS have ranged from 39% to 87% but a more appropriate range may have been 39% to 47% which excludes the mild symptoms of pain (Zaza, 1998).

It is only in the last twenty to thirty years that interest has been stimulated in PRMDs. Since the 1980s, there has been a rapid set up of musicians’ clinics, performing arts medical organisations, and increased publication of research regarding prevalence and risk factors of PRMDs (Zaza et al, 1998). GPs and physiotherapists have now begun to look at evidence for the treatment of PRMDs. Heming (2004) stated that of 41 people with a PRMD, 21.5% attended a physiotherapist seeking help. This shows that physiotherapists are beginning to play an important role in the recovery process from PRMDs.

Musicians’ are quite descriptive when explaining their PRMDs. The emotional effects were described as being “traumatic”, “devastating”, “horrible”, and “frightening”. There can be feelings that the pain “will never go away, will never resolve” (Zaza et al, 1998). It can also have an impact on the activities of daily living, and can have a huge impact on financial stability if the person is dependent on playing music to earn money. Even though these are common feelings in relation to a PRMD, musicians have different ways of coping with the problem. These include denying or ignoring the problem, employing self-help strategies, or seeking help from a healthcare provider (Zaza et al, 1998) Reasons for ignoring or denying the problem include the belief that pain is a
normal part of playing, lack of time to have it seen to, financial reasons and adherence to the “no pain, no gain” belief (Zaza et al, 1998).

Existing quantitative studies have primarily examined the prevalence of PRMDs within the following areas: musicians as a whole (Zaza, 1998), professional musicians (Heming, 2004), student musicians (Fry, 1987), instrument group (e.g. prevalence within the woodwind group of musicians) (Cebriá i Iranzo et al, 2010), and piano players (Bragge et al, 2005). Risk factors for PRMDs has also been an area that has been examined quite thoroughly within the existing research as it is important to know the risks to gain knowledge into their prevention and treatment (Zaza and Farewell, 1997; Bragge et al, 2005).

It has been found that when the data in all the above studies is synthesised together as best as possible that the prevalence rate is approximated at between 31% and 47%. However the majority of studies used are of poor methodological quality such as small sample size and low response rate.

As the prevalence statistics are so high, it is important to acknowledge the risk factors for PRMDs. With regards the risk factors for PRMDs, it has been said that gender, increasing age, increased practise time, and playing while tense are all significant. The above studies and reviews however, do not look into any detail on the prevalence of PRMDs in single-instrument musicians, apart from the piano. In addition they do not look at whether certain instruments have greater or lesser risk of developing a PRMD than some other instruments. Consequently, this study focuses on the prevalence of PRMDs in musicians that only play guitar.
2. Study Aims

The aims of this study are to determine the prevalence of PRMDs to the upper limb within the last 3 months in guitar-playing 3rd level students, and to determine the most affected upper limb location within this population. The objective of this study is to gain an understanding of any relationships between PRMDs and gender, age, playing style, or length of time playing the guitar.
3. Methods

3.1 Study Design

Questionnaires are an indirect method of collecting data (Maher and Kur, 1983). They can be used in a variety of contexts in survey research: in mail surveys, telephone interviews, formal, structured interviews, and in surveys carried out using computers and other forms of IT (Webb, 2000). An online survey approach was chosen as a large sample is easy to obtain (Evans and Mathur, 2005) and it helps to reduce the response time compared to a postal questionnaire (Granello and Wheaton, 2004). There are more benefits associated with the use of an online questionnaire that play an important part in its use. Online surveys can be administered in a time-efficient manner which helps with time allowed for data collection. It is also reported that online surveys are convenient in that they allow the respondents the opportunity to answer individual questions in their own time and to complete it at a time that they would not feel rushed into (Evans and Mathur, 2005). Granello and Wheaton (2004), state that web-based surveys tend to be easily understood and completed by respondents. There is also the issue of anonymity which allows recipients of the survey to provide accurate data surrounding any sensitive questions that may arise. For this study, a self-report online questionnaire of the University of Limerick (UL) students was conducted through the use of Survey Monkey.

3.2 Ethics

Ethical approval for this study was granted by the University of Limerick Research Ethics Committee. Informed consent was obtained from all participants.

3.3 Instrument

The questionnaire used was of original design. This has the downfall of not having reliability or validity data available but it does allow the investigator to assess specific issues more clearly and directly than standardised questionnaires (Maher and Kur, 1983). The survey investigated whether the participant had experienced any aspects of a PRMD or not, if so they were then asked to follow-up on this question by describing the
symptoms of their PRMD. There were 6 sections within the survey, one of which requested general information from the participant, five of which requested information relating to pain, weakness/fatigue, lack of control, numbness, and paraesthesia. Each symptom was looked at in terms of when it first came on, how long it took for that specific symptom to come on, how long it lasted, and what area of the upper limb it affected. The survey consisted of 39 questions, which were all close-ended. This method was used as open-ended questions can lead to non-valid and inadequate responses. In addition it is found that open-ended questions tend to be skipped more than close-ended questions. (Reja et al, 2003). No pilot study was used to test the questionnaire and as a result of this some mistakes were present within the questionnaire. These are outlined as limitations in the discussion section.

3.4 Inclusion/Exclusion Criteria

Participants were required to play the guitar as their only instrument, be over 18 and be a current student within UL. Volunteers were required to have had no injury (unrelated to guitar-playing), illness, or disease which caused them to drop the standard at which they played at in the previous three months. In addition they must not have had surgery to their upper limb in the previous 12 months.

3.5 Participants

All current students within UL were considered as possible participants for this study. These included any undergraduates, postgraduates, Masters, or PhD students. This allowed for a large, random sample to be obtained.

3.6 Data Collection

Survey Monkey was deemed suitable to use as a questionnaire host due to its ease of use and large popularity within the college. E-mail was chosen as the method of contact for requesting student participation.

The questionnaire and a subject information sheet (see Appendix 1) were sent as attachments to an e-mail inviting students of UL to participate in the survey. Details as to what the survey was about were included in the information sheet. Confidentiality
and anonymity were highlighted within the information sheet. Participant consent was assumed if they completed the questionnaire.

The questionnaire was opened for a time period of ten days. Initially, a reminder e-mail was to be sent out after ten days but the completed questionnaires at this time were twice the amount expected and so no reminder e-mail was necessary. After the ten days the survey was closed and people were unable to participate after this point.

3.7 Data Analysis

Data was collated and analysed using Statistical Package for Social Sciences (SPSS) version 17.00, GraphPad Prism 4, and Microsoft Excel. Simple frequency calculations, contingency tables and the Fisher’s Exact Test were used to investigate the relationship between prevalence of reported symptoms and gender, age group, weekly practise time, and time spent studying/learning guitar. P-values of less than 0.05 were considered significant.
4. Results

4.1 Response Rate

A total of approximately 11 000 recruitment e-mails were distributed, 260 of which were returned. 16 of the returned questionnaires were not completed in full and so were discounted, leaving 244 responses for analysis. This gave a valid response rate of roughly 2.2%.

4.2 Population Characteristics

The gender breakdown of the 244 participants was 187 males (77%) and 57 females (23%). The majority of the participants were in the 18-21 age group, (58%) with 23% in the 22-24 group, 5% in the 25-27 group, and 14% in the 28+ group. In relation to playing method, a predominant number of people used a plectrum to play (69%) as opposed to using their fingers (31%). A large proportion of the respondents preferred to sit down whilst playing the guitar (86%) compared to only 14% who stood whilst playing. A quarter of the participants specified that they had started learning to play the guitar more than eight years ago and almost a further quarter of the respondents (23%) started playing four to six years ago. The most frequent amount of weekly practise time per person was 2-4 hours per week (25%), with the second most frequent being 4-6 hours per week (23%).

4.3 Pain

52 of the total respondents (21%) experienced some level of pain which affected their ability to play at the level they were accustomed to. The anatomical areas most commonly affected were the fingers (60%) and wrist (52%), which was shown to be statistically significant when put in direct comparison with other areas of the upper limb (p < 0.0002 for finger and p < 0.05 for wrist). Of these 52 cases, the mean pain score on the verbal numeric rating scale (VNRS) was reported as being 3.8 ± 2.1. Cases were then split into mild and moderate/severe pain scores. Moderate/severe cases, that is, cases with a pain score of 5 or more, had a mean pain score of 6.9 ± 1.5. Mild cases had a mean pain score of 2.8 ± 1.0.
Pain in 92% of these moderate-to-severe cases first came on more than a year ago, and the majority of the milder cases (64%) also started more than a year ago. The time playing the guitar before the onset of pain was generally quite mixed. The onset of pain was most frequently observed at 30-45 minutes in the moderate to severe group (38%) and at 15-30 minutes in the mild group (38%). In the moderate/severe group the pain had subsided up to a few hours after its’ onset in a slight majority of people (54%) whilst almost a quarter (23%) reported that it took more than a month for the pain to settle down. In the mild group the pain subsided after a few minutes in 69% of cases and after more than a month in only 3% of cases.
Figure 1: Number of Participants that Suffer from Differing Levels of Pain.

Figure 2: Upper Limb Area Affected by Any Level of Pain (Mild, Moderate, and Severe).
4.4 Weakness/Fatigue

37 of the total respondents (15%) experienced weakness or fatigue which affected their ability to play at the level they were accustomed to. The anatomical areas most commonly affected were the wrist (59%), thumb (49%), and finger (46%). This is shown to be statistically significant when compared against other areas (p < 0.0003 for wrist, p < 0.0006 for thumb, and p < 0.02 for finger). 73% of people with weakness or fatigue first noticed its onset more than a year ago. This weakness or fatigue took between 30-60 minutes to first come on in 46% of people. The weakness subsides within a few minutes in 56% of cases and within a few hours in 92% of cases.

4.5 Lack of Control

69 participants (28%) suffered from lack of control which had an effect on their ability to play at a level they were used to. The anatomical sites most commonly affected by lack of control were the fingers (58%) and the wrist (57%) with the thumb being much less affected (36%). 71% of cases were noticed initially more than a year ago. The time playing the guitar for the commencement of this lack of control was varied. The most chosen time groupings were 30-45 minutes (25%), 45-60 minutes (19%), 15-30 minutes (19%), and 0-15 minutes (13%). This symptom lasts for only a few minutes in 71% of cases and for no longer than a few hours in a further 17% of cases.

4.6 Numbness

8 of the total respondents (3%) experienced a numbness that affected their ability to play at the level they were accustomed to. This was mainly confined to the fingers with 75% complaining of finger numbness. This is not of statistical significance compared with the forearm, wrist, palm or thumb (p > 0.05). In all the cases of numbness, the first occurrence began over a year ago. The time playing guitar before the numbness came on differed from person to person with 13% respectively reported for each time category of 0-15 minutes, 30-45 minutes, 45-60 minutes, 60-75 minutes, 75-90 minutes and 105-120 minutes, and 22% reporting a time frame of 15-30 minutes. The numbness cleared after a few minutes in 38% of cases, after a few hours in a further 25%, within a week in 12%, and after more than a month in the final 25% of cases.
4.7 Paraesthesia

14 of the total respondents (6%) experienced paraesthesia, or pins and needles, that affected their ability to play at the level they were accustomed to. The most commonly affected anatomical area by paraesthesia is the fingers with 36% of people reporting pins and needles in this area. This is however, not statistically significant when compared to the other areas of the upper limb (p > 0.05). Of these 14 cases, the mean paraesthesia score on the verbal numeric rating scale (VNRS) was reported as being 3.8 ± 2.2. Paraesthesia in 64% of participants initially came on more than a year ago. The symptom came on after 0-15 minutes of playing the guitar in 29% of participants and after 45-60 minutes of playing in 14% of participants. The paraesthesia resolved after a few minutes in 57% of this sample and a few hours in a further 29%.

![Figure 3: Number of People Affected by Each Symptom of PRMDs.](image-url)
4.8 Overall Prevalence

46% of the 244 respondents reported experiencing at least one of the symptoms of a PRMD. Excluding mild symptoms of pain, 41% of respondents reported experiencing a PRMD. Of all those affected by a PRMD, 60% of them experience only one of the symptoms of a PRMD, 26% experience two symptoms, 9% experience three symptoms, 4% experience four symptoms, and 1% experience all the symptoms. Furthermore, if the mild symptoms are excluded the breakdown becomes: 71% experience one symptom, 19% experience two symptoms, 8% experience three symptoms, 1% experience four symptoms, and 1% experience all the symptoms.
4.9 Risk Factors

Gender: Of the 187 males who responded to the questionnaire, 44% reported having some form of PRMD. Of the 57 females who responded, 53% reported having some form of PRMD. When mild symptoms are excluded, 39% of males and 49% of females were affected. The difference is shown not to be statistically significant (p = 0.17).

Increasing Age: 39% of 18-21 year olds, 45% of 22-24 year olds, 54% of 25-27 year olds, and 38% of 28+ year olds are affected by a PRMD. The differences between each group have been shown not to statistically significant (p ≥ 0.38 for all values of p).

Practise Time: The highest recordings of PRMD percentages, with regard to length of time spent playing the guitar a week, are in the 0-2 hours per week and the 6-8 hours per week categories with 50% in each group. A similarity is found in the PRMD percentages of the 2-4 hours, 4-6 hours, and 10+ hours a week categories with the three groups reporting PRMD percentages of 36%, 39%, and 38% respectively. The lowest PRMD percentage with regards to the weekly practise time was found to be 18% in the 8-10 hours per week category.

Time spent learning the guitar: The highest recorded PRMD percentage in relation to time spent learning the guitar was 44% amongst the category of people who had spent 6-8 years playing the guitar. However, this percentage did not differ much from other categories with the 8+ years following close behind with 43% and 0-2 years with 42% PRMD percentage recorded. Following only a further 3% drop in PRMD percentage, 39% of people who had spent 4-6 years playing and 38% of people who had spent 2-4 years playing were found to be the lowest two categories reporting a PRMD in relation to time spent learning guitar.

Sitting vs. Standing: The symptoms of PRMD were more frequently reported in people that sit whilst playing guitar as opposed to those who stand whilst playing. 31% of people that stand reported having a PRMD compared to 43% of people that sit.

Plectrum vs. Finger-Plucking: The PRMD prevalence in people who use a plectrum to play and those who play using their fingers are equal (41%), which shows no association between a person’s method of playing and the development of PRMDs.
5. Discussion

Up to 90% of student musicians will experience a physical playing-related disorder at some point in their careers (Guptill et al (2000) cited in Guptill & Golem (2008)). This survey revealed a 41% current prevalence of playing-related musculoskeletal disorders in a group of student guitar players in the University of Limerick. The fact that 21% of guitarists experience pain (5% with mild pain scores excluded), 17% experience weakness or fatigue, 28% suffer lack of control or cramping, 3% experience numbness, and 6% experience paraesthesia indicates that physiotherapists should play an important role in treatment of PRMDs in guitarists as these symptoms are all under the scope of treatment of the physiotherapist.

This survey differed from previous studies of PRMD prevalence as it looked specifically at guitar players and used an operational definition of PRMDs to help determine if a participant had a PRMD. Two studies looking specifically at PRMDs in guitar players were found but were inaccessible and this made direct comparison difficult. However, earlier studies documented prevalence of PRMDs in musicians; 39-47% in all musicians was documented in Zaza (1998), and 38.4% in piano students was recorded in Bruno et al (2008). These results correlate with the prevalence of PRMDs found in this study. In both these studies, the prevalence percentages were calculated after mild symptoms of pain had been excluded. This was due to their inclusion causing inflated estimates and misleading conclusions. Those who reported pain scores of 4 or less were considered mild (Edelen and Saliba, 2010) and thus were also excluded when calculating the overall prevalence within this study.

Many risk factors have been mentioned in previous studies (Zaza & Farewell (1998); Bragge et al (2006); Wu (2007), these include gender, BMI, number of years spent learning the instrument, number of hours spent practising per week, previous trauma, hand size, and increasing age, posture, and technique. These studies looked at risk factors either for musicians as a whole or for pianists alone. This study focussed on some of these risk factors specifically for guitar players.
Within this study the most affected anatomical area of the upper limb were found to be the finger and the wrist. The finger was reported as being the most common area affected by pain, lack of control, numbness, and paraesthesia whilst it was the third most common area affected by weakness/fatigue. The wrist was the most common area affected by weakness/fatigue and the second most common area affected by pain, lack of control, and numbness. This is in agreement with Fry (1987) who states that 61% of students in a music school reported their fingers and wrists as being the most affected area, whilst 39% of students reported a different area of the upper limb being most affected. However, this is in contrast with Heming (2004) and Kaufman-Cohen & Ratzon (2011) who reported the most commonly affected area is the shoulder. It must be taken into account that Heming (2004) and Kaufman-Cohen & Ratzon (2011) both looked at more classically-minded musicians and it is less likely that the guitar featured prominently in these studies. Whereas Fry (1987) would have had more guitarists participating in his study, therefore it is more likely to yield more comparative results when coupled with this study.

Being of female gender was reported as being statistically significant in relation to the development of a PRMD in Zaza & Farewell (1998) and Wu (2007). In this study females were more frequently affected than males by PRMDs. There was a 10% difference in PRMD percentage between the groups, the difference was not found to be statistically significant. This may be due to difference in sample size between the two participant groups with 77% of participants being male and only 23% being female. Thus it can be concluded from this study that gender may not affect the probability of acquiring a PRMD in student guitar players.

Increasing age was reported by Bragge et al (2006) to be of statistical significance to a pianist obtaining a PRMD. In this study the guitarists were divided into the age groups 18-21, 22-24, 25-27 and 28+. The results did not correlate with the aforementioned study that the older the musician, the higher their chance of developing a PRMD. It was shown that 25-27 year olds (54%) were most likely to develop a PRMD, followed by 22-24 year olds (45%) and 18-21 year olds (39%). 28+ year olds (38%) were least likely of developing a PRMD. These results were not shown to be statistically significant; however this may be in part due to small sample size acquired.
for the three older age groups when the participants were split into categories. Therefore the conclusion drawn from this study is that increasing age may not be of importance when examining risk factors for PRMDs in student guitar players.

Length of weekly practise time was discussed in Kaufman-Cohen and Ratzon (2011). They stated that this was not a factor to be taken in isolation, but coupled with other factors has an influence on PRMD development. In this study the guitarists were separated into groups depending on how long they spent practising the guitar per week. People who spend 0-2 hours and 6-8 hours a week practising were found to be most at risk (50%). This was followed by 4-6 hours (39%), 10+ hours (38%), and 2-4 (36%). People who practised 8-10 hours a week were found to be least at risk (18%). Therefore length of weekly practise time does not appear to correlate with PRMD development. Thus it may be theorised that those who practise a little amount a week and those who practise a middle-range amount a week may be more at risk of developing a PRMD. However, the sample size is too small for this to be stated with any confidence.

Zaza and Farewell (1998) reported that there is an association between the lengths of time spent learning the guitar and the acquisition of a PRMD. In this study it was found that there is no relationship between these factors. All of the groups were within the range 37-45% prevalence. No one group showed a significant difference to any of the other groups. From this it can be said that length of time spent playing the guitar is not found to be a risk factor in terms of developing a PRMD. However, it again has to be taken into account that sample sizes for each group were small.

Other factors that were looked at as possible risk factors were posture whilst playing, that is sitting or standing whilst playing the guitar. Technique whilst playing that is the use of plectrums or fingers for playing the guitar. No studies looked at these factors in isolation. It was found that guitarists are more likely to have the symptoms of a PRMD if they sit down whilst playing as opposed to if they are standing up whilst playing. This may be due to the different posture that the upper limb is held in to maintain a comfortable playing style. Sitting down puts more mechanical stress on the body and thus predisposes the guitarist to a PRMD. This association is not shown to be statistically significant and may be due to the large difference in sample sizes between the two groups. Furthermore, in relation to the use of a plectrum or fingers whilst
playing; a guitarist will not be more susceptible to developing a PRMD if they use a plectrum to play than if they use their fingers. Again it may be worth taking into account the sample size when applying these results as there is a considerable difference between the numbers in each group.

There is an emphasis on obtaining high response rates to try and decrease the bias associated with non-response. Low response rates may be considered to cause; “more damage in rendering a survey’s results questionable than a small sample” (Curtin et al, 2001). This study produced a very low response rate. However, of the 11,000 sampled, it was unknown as to who played the guitar as their only instrument and so it was necessary to email everyone. Had only those who played guitar been emailed then the response rate would have been higher as the sample would have been smaller.

It can be seen that sample sizes within subgroups of this study were quite small. This may yield less valid results when analysing the data within these groups. It is widely understood that the use of larger samples provide results that are more precise estimates of the population being studied (MacCallum et al, 1999). Therefore it would have been much more beneficial to have a larger sample size for analysing the subgroups.

Another limitation to this study was the structure of the questionnaire. The logistical features of Survey Monkey could have been used more effectively to prohibit participants from answering unnecessary questions. Also the question regarding most affected area by paraesthesia was set-up incorrectly and only allowed one area to be chosen, as opposed to having the freedom to choose as many answers as were relevant. Pre-testing is an important part of a survey as it allows you to determine whether the questions make sense, are in a logical order, contain bias wording, or to fix any mistakes (Gaddis, 1998). A pre-test of this study would have been beneficial as it would have allowed the aforementioned mistakes to be rectified.

“A potential for recall bias exists whenever historical self-report information is elicited from respondents” (Raphael, 1987). Recall bias occurs when the accuracy of recall, with regard to prior exposures is diminished due to the inability to remember the exact events. This may lead to an under-reporting or an over-reporting of true exposures
and so decrease the accuracy of results. Currently, survey methods are predominantly used to calculate prevalence as there are no objective measures that are in widespread use to assist in the calculation of PRMD prevalence as of yet.

To conclude, the majority of findings from this study cannot be applied to the guitar-playing population as a whole, as the sample size of the subgroups was too small to show any statistical significance. It cannot be said with confidence that any of the factors reported in this study can be identified accurately as true risk factors in guitar players. As the majority of people who reported having a PRMD had experienced it for more than a year, it is of vast importance that preventative measures be taken to help decrease PRMD prevalence. Future research should look into this particular area, along with continued high-quality research into the calculation of single-instrument PRMD prevalence and the identification of risks factors for development of PRMDs that are associated with these instruments. Any further research that is carried out should have a large sample size as a priority of the study to enable accurate results to be achieved.
References


Appendices

Appendix 1

Survey on the prevalence of playing-related musculoskeletal disorders to the upper limb in male and female students that play the guitar.

Information Sheet

What is the study about?
This study aims to determine the prevalence of playing-related musculoskeletal disorders in the upper limb of people that play the guitar.

What will I have to do?
You will have to fill out the questionnaire that is attached with this information leaflet. By completing the questionnaire you are giving your consent to be part of the study.

What are the benefits?
There are no direct benefits to the participants. They will, however, realise that the problem they have is a known problem and may encourage them to get it seen to if it is serious enough and have not already had it seen to. Participants will also be helping in the research of an area that is only now uncovering its promise.

What are the risks?
There are no risks to the participant.

What if I do not want take part?
Participation is completely voluntary and you are under no obligation to take part.

What happens to the information?
All information obtained will remain confidential and anonymous. Results will not be disclosed to anybody not involved with the study.

What if I have more questions?
You can at any point contact the project investigator through the contact detail below. If you have any concerns or require any further information regarding your pain or discomfort, you could contact your local Chartered Physiotherapist.

What if I change my mind about the study?
You are free to withdraw from the study at any time for any reason without any consequence.

Project Investigator
Darren Scully, 4th Year Physiotherapy Student, 0748633@studentmail.ul.ie

‘If you have concerns about this study and wish to contact someone independent, you may contact’
The Chairman of the University Of Limerick Research Ethics Committee,
Prof. Alan Donnelly,
PESS Department,
University of Limerick,
Limerick.
Tel: (061) 202672

If you have any concerns or require any further information regarding your pain or discomfort, you could contact your local Chartered Physiotherapist.
Appendix 2

Recruitment E-mail

Hi everyone,

I'm a 4th year physiotherapy student currently doing my FYP on the frequency of playing-related injuries in guitar players. Below is a link to a questionnaire that should take no longer than 10 minutes to carry out. If you are 18 or over and play the guitar, and only the guitar, I would appreciate it very much if you took your time to complete it.

If you have had surgery in the last 12 months or any injury in the last 3 months to your shoulder/arm/hand, could you please disregard this e-mail.

Also, find attached an information sheet about the study which you should read before completing the questionnaire

http://www.surveymonkey.com/s/THWZ8GT

Regards,
Darren Scully.