

Spring 5-25-2019

# Nurse Practitioner Led Identification and Treatment of Knee Pain Severity Based on Evidence Classification Protocols

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## Digital USD Citation

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“Nurse Practitioner Led Identification and Treatment of Knee Pain Severity Based on Evidence  
Classification Protocols”  
UNIVERSITY OF SAN DIEGO  
Hahn School of Nursing and Health Science

DOCTOR OF NURSING PRACTICE PORTFOLIO  
by

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A Portfolio presented to the

FACULTY OF THE HAHN SCHOOL OF NURSING AND HEALTH SCIENCE  
UNIVERSITY OF SAN DIEGO

In partial fulfillment of the Requirements for the degree  
DOCTOR OF NURSING PRACTICE  
May 2019

### Abstract

Title: Nurse Practitioner Led Identification and Treatment of Knee Pain Severity Based on Evidence Classification Protocols

**Background:** Knee pain has become the 10<sup>th</sup> leading office visit in the United States. Prevalence of knee pain has increased 65% in the past 20 years accounting for approximately 4 million clinic visits every year. One out of five men and one out of four women in the United States suffers from knee pain. Treatment protocols in actuality are based on physical therapy, pharmacological treatment, or surgical management. However, research has demonstrated that knee pain and progression of knee related illnesses may be prevented by diet, weight control, knee exercises, and early treatment intervention.

**Purpose of Project:** a) To determine the level of knee pain severity after administration of the Western Ontario and McMaster Universities Arthritis Index (WOMAC) questionnaire; b) To increase knee pain management knowledge by at least 50% in a 2-month period.

**EBP Model/ Framework:** The John Hopkins Model was used to guide this project.

**Evidence Based Intervention(s):** The WOMAC questionnaire was provided to every patient presenting to the clinic with a complaint of knee pain. Printed material on knee pain management and resources were provided based on WOMAC Scores.

**Evaluation/ Results:** A total of eighteen patients received knee pain management educational material. Fourteen respondents expressed an increase in knowledge on how to properly manage knee pain. One respondent expressed no benefit, and three respondents were not able to be reached by phone.

**Implications on Practice:** Early non-surgical interventions may contribute to prevention and a better management of knee pain. Early detection and management will improve quality of life, decrease progression, and decrease clinic visits.

**Conclusion:** The WOMAC instrument is a reliable and validated tool that has been utilized in numerous research trials as an assessment tool for different knee conditions. Implementation of the WOMAC tool on a primary care facility will assist on obtaining specific information related to knee pain to ensure that patients are provided with the most up to date research information.

## **Introduction**

Knee pain is a medical condition that can affect patients in different aspects of their life if not managed properly. Patients lack knowledge of the most recent research on the appropriate measures to prevent or manage knee complications. In order to individualize a plan of care and provide the best information it is necessary to obtain a baseline of their knee pain severity and function. The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) is one of the most valid and reliable tools used to assess different subcategories of knee pain that assist on understanding the degree of the problem (Rodriguez-Merchan, 2011). The implementation of the WOMAC tool will not only assist on appropriately assessing knee pain severity on different levels, but it will also serve a tool to identify those at risk for osteoarthritis (Sathiyarayanan, Shankar, & Padmini, 2017).

## **Background and Significance**

Knee pain has become the 10<sup>th</sup> leading office visit in the United States, affecting function and quality of life among millions of patients. Prevalence of knee pain has increased 65% in the past 20 years accounting for approximately 4 million clinic visits every year. One out of five men and one out of four women in the United States suffer from knee pain. Obesity is one of the factors that leads to joint misalignment and damage. Treatment protocols in actuality are based on physical therapy, pharmacological treatment, or surgical management. However, research has demonstrated that knee pain and progression of knee related illnesses may be prevented by diet, weight control, knee exercises, and early treatment intervention (Jones, Covey, & Sineath, 2015).

## **Purpose of Project**

The purpose of this evidence-based project was to obtain a baseline on the severity of knee pain after completion of the WOMAC assessment questionnaire and to provide the appropriate

intervention based on scores. Grace Family Health will expand its services by providing Sports Medicine services and this tool will be adopted by the clinic.

### **Literature Review**

An extensive literature search was conducted in PubMed, Cochrane, and CINAHL databases for the newest research findings. The key words used for the search were knee pain tool, knee pain management, knee pain exercises, WOMAC tool, and knee pain medications. The search criteria produced many article references after each keyword. However, only the articles with the most relevant information were utilized. In order to accomplish the EBP Project goals to increase knowledge on knee pain management a series of organized activities were implemented.

Interventions were based on literature support.

The authors Jones, B., Cover, C.J., & Sineath, M.H. (2015), conducted a literature research to provide the latest guidelines and knee pain management adopted by the American Academy of Family Physician. Some of the recommendation included weight loss, aerobic and strength training, braces, and administration on Non-Steroid Anti-inflammatory Drugs. A handout was made providing specific exercises for patients with knee pain. Each exercise was described and a picture of how to properly perform the exercise was included under each description. The appropriate doses and recommendations for pharmacotherapy were provided on the handout.

A systematic Review conducted by Button, K., Roos, P. E., Spasić, I., Adamson, P., & van Deursen, R. W. M. (2015), demonstrated that patients with a variety of knee complications showed better outcomes after applying a self-care and an exercise program. Different studies on this review demonstrated that effective training and resources for exercises and self-management was necessary for positive outcomes. Better outcomes were not demonstrated when these two components were implemented by a specific group of professionals. Handouts provided at Grace

Family Health were clear, concise, and provided management options with clear instructions on actions to take for self-management. The exercise portion on the handout was clearly explained with an image of how to properly position the body and the number of repetitions and the time frame for each individual exercise.

The effectiveness of knee aquatic exercises and land-based exercises were compared on a systemic review and results indicated that both exercises were equally effective. The review consisted of eight Randomized Controlled Trials that included a total of 579 patients. The two methods compared proved to improve knee pain, function, and quality of life on a short and long term basis. The WOMAC questionnaire was one of the tools implemented to measure outcome (Dong et al., 2018). Lack of pool accessibility may not be an option for many patients and for this reason land-based exercises were emphasized.

Obesity has been proven one of the major factors that lead to knee complications such as osteoarthritis. A randomized clinical trial study revealed that obese or overweight patients diagnosed with type 2 diabetes that underwent intensive lifestyle interventions such as weight loss and exercise, demonstrated a decrease of 15% on risk for developing knee pain. Weight loss combined with exercise may prevent patients from developing knee pain (White et al., 2015).

Administration of the WOMAC tool may be used to identify individuals at risk for developing osteoarthritis: A level 4 cross sectional study conducted on 103 subjects who presented with knee pain individuals indicated the the use of a WOMAC tool identified patients who were at risk for developing knee osteoarthritis (Sathiyarayanan, Shankar, & Padmini, 2017). Evaluation of results for this project will also assist on identifying individuals who might be at risk for developing future osteoarthritis complications. The MD will be able to implement an early plan for prevention. The WOMAC is comprised of a series of 24 simple questions that

can be answered using 0-4 visual analog scale. Knee pain, stiffness, and function are the three main categories. In order to obtain a score, it is necessary to add all scores and to divide by the number of items. The worst possible score is 100 (Rodriguez-Mechan, 2011). For this EBP project patients received specific instructions for results less than or greater than 50.

### **Theoretical Model**

The John Hopkins Model was model created by nurses for nurses to implement the latest research findings in patient care. The model utilizes inquiry of a possible problem as the starting point and continues to practice and learning. Practice question, evidence, and translation are the three components that translate into implementation of best practices and practice improvement. The model provides a series of tools that serve as a guide from start to finish on the proper steps to take to develop and implement an evidence-based project (Vera, 2017). The inquiry that served as the starting point was questioning the reason why there was no printed material for knee pain management in a clinic where there is a high population of patients with a primary complaint of knee pain.

After a detailed examination was conducted on the current practice, it was found that there was no printed material available for providing education on knee management. This model can easily be implemented in a clinic setting and in this case it will be the best model asset for the development of a new teaching tool for this clinic. The John Hopkins Model utilizes the best and newest research findings in patient care. The latest evidence of the effectiveness of video education and learning will be reviewed analyzed to be integrated for improved health education.

### **Practice Change Process**

The population for this Evidence-Based project included all patients presenting to Grace Family Health with the main complaint of knee pain. A project proposal was presented to the Medical Doctor (MD) in charge of the clinic. The MD agreed for implementation of the project at any time and provided full support. The DNP student worked in collaboration with the Academic Advisor to submit to IRB approval at USD. After IRB approval was obtained, the student proceeded with to inform clinic personnel about the project. A meeting was conducted for all staff members to be informed of the project.

The WOMAC tool was explained in detail and all Medical Assistants were instructed to provide a questionnaire to patients presenting with knee pain. Specific instructions were provided on how to properly grade the questionnaire and provide printed material according the scores obtained. A binder for questionnaire questionnaire was placed at the nursing station along with the Nurse Practitioner Student information for any questions. The student collected data on a weekly basis and ensured that each form had the required information. A phone call was made by the NP student to ask about the effectiveness of the written material provided.

### **Cost Benefit Analysis**

Prevention and proper management of knee pain will reduce office visits. There were no costs associated with the implementation of the EBP project.

### **Results**

Data was collected over a four-month period from October 2018 to February 2019. One of the major challenges was ensuring that each patient presenting with knee pain was provided a questionnaire and teaching material. A total of 18 patients completed the WOMAC tool and received instructional material. Final results demonstrated that fourteen patients expressed



effectiveness of knee pain management management, one patient expressed no benefit, three patients were not able to be reached (Figure 1). The respondents were eleven females and six males indicating that females were more prominent on seeking knee pain care compared to men (Figure 2). This piece of information supported previous research findings indicating that knee pain is more prevalent among woman (Jones, Covey, & Sineath, 2015).

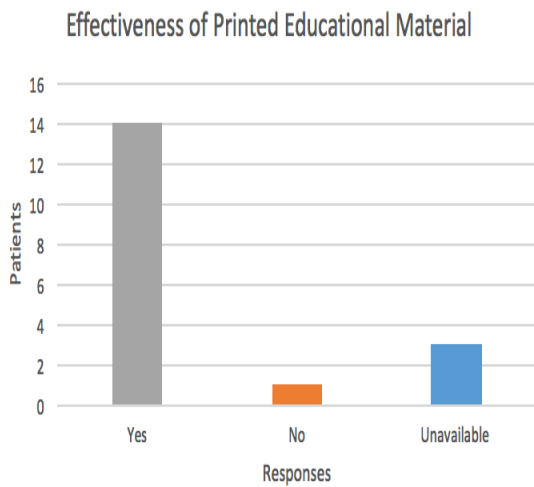


Figure 1. *Results on Printed Material*

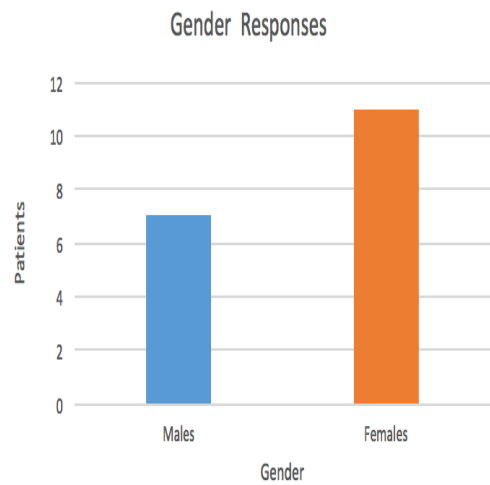


Figure 2. *Results by Gender*

Ages ranged from 16 to 81 years old with WOMAC scores from 4% to 99% (Table 3). Based on the Body Mass Index (BMI) classification protocols from the Centers of Disease Control (CDC, 2017), 50% of participants fell into the obese category, 28% were considered overweight, and only 22% under the healthy category (Figure 4). Data showed that 78% of all participants were not within ideal body weights.

The goal of increasing knowledge on appropriate knee pain management by providing printed material was met. Grace Family Health opened an additional clinic that also provides sports medicine services during the period of the project implementation. This became an additional

challenge due to the fact that patients with a closer address to the new location were seeking medical care at the new facility and not at Grace Family Health.

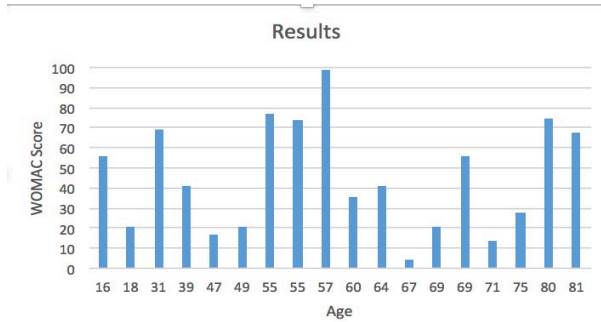


Figure 3. Scores and Ages of Participants

Classification by BMI

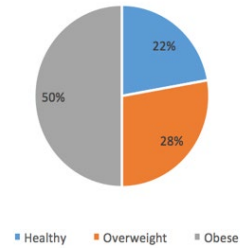


Figure 4. Classification based on BMI

### Implications for Practice

Focusing on patient education will prevent future health complications. Knee pain can be prevented or minimized if patients are informed of their options. Despite the great number of online resources for health information there is a lack of consistency and validity. Patients seek assistance from unreliable sources and conflicting information provided by these sites can aggravate health problems. Proper knee pain assessment and education will allow patients to focus on Evidence Based Practice interventions that will bring positive health outcomes.

### Discussion

Proper identification of knee pain severity and treatment will not only improve knee pain but it can also increase the quality of life in patients. Pain and other physical limitation may lead to isolation and possibly other mental health complications. Patient teaching has been proven to

provide immediate effects on outcomes. Unfortunately, if there is no system in place it becomes difficult for providers to spend the time required for appropriate patient teaching. The number of clinic visits due to knee pain increment each year. Patient education can be delivered by different forms using a variety of resources such as technology and printed material. It is necessary for providers to ensure that patient understand the educational material in order to obtain positive results.

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