The relationship between pain and physical function in adults with Knee Osteoarthritis

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ABSTRACT: Knee Osteoarthritis is estimated to be the most common causes of disability in older adults. Knee and hip osteoarthritis pain in older adults is very common and osteoarthritis is one of the most common causes of joint pain and physical, mental and social disability. There is no study in Iran to explore the forms of relationships among pain, demographic characteristics and physical function. Therefore, this study was undertaken to describe the relationship among pain, demographic characteristics and physical function in patients with knee Osteoarthritis Considering Iranian patients’ culture in daily activities. Eighty-one knee Osteoarthritis patients referring to Rheumatology clinic depended on Tabriz University of medical science participated in this study with convenience sampling method. Data was collected through the Western Ontario and McMaster Universities questionnaire, that ordered in three subscales which included pain (5 items), stiffness (2 items) and physical function (17 items). Data analyzed using SPSS software. The results of linear regression analysis indicate the relationship among physical function, pain, stiffness, and duration of disease were significant. From these results it can be concluded pain and joint stiffness are important factors that affect the ability to perform activities of daily living in patients with knee Osteoarthritis. Therefore, we suggest that patients become familiar with nonpharmacologic pain relief methods and muscle strengthening exercises to overcome disability from disease.

Key Words: adult; knee osteoarthritis; pain; physical function

INTRODUCTION

Knee Osteoarthritis (OA) is estimated to be the most common causes of disability in old adults (Toda and Tsukimura, 2004). Patients with knee osteoarthritis suffer from progressive disability when walking, going up and down stairs (Chuang et al., 2007). The high incidence of OA in old people and the aging of the people will direct to increased OA and costs to treat these patients as a result (Boutron et al., 2008). A systematic review of incidence and prevalence of knee OA in people older than 55 years in the United Kingdom reported an incidence of 25 percent per year, a prevalence of inability caused by knee OA of 10 percent, and severe disability as regards two to three percent (Peat et al., 2001). Knee and hip osteoarthritis pain in old adults is very common and osteoarthritis is one of the most common causes of joint pain and physical, mental and social disability (Altman et al., 1991; McAlindon et al., 1992). While OA can affect any joint, hip and knee are most frequently involved joints (National Institute for Health and Clinical Excellence, 2008; Felson, 2009). There are no common treatments for osteoarthritis that could be prevented the development of joint damage caused by OA, at present. Consequently, the purposes of management of OA patients are to control pain and, decrease disability, improve the quality of life, and educate the patient about his or her role in self management (Fajardo and Di Cesare, 2005).

Osteoarthritis may be affecting various aspects of patients’ quality of life. Overweight and pain are factors that could be cause these problems (Pells et al., 2007). Patients order to relief pain had to minimize physical activity and have sedentary life (Bunning and Materson, 1991). However, Recent reports of Centers for Disease Control and Prevention, the American College of Sports Medicine, the American surgeon society and the
American Heart Association suggests that having an active lifestyle and mobility, has many health benefits. Physical inactivity is a health problem in OA patients. Various studies have confirmed the fact that improvement the quality of life in OA patients with increasing physical activity and maintaining efficiency, reducing disability, and musculoskeletal disorders (Felson et al., 2000).

According to the Arthritis Research Center (2002), pain is the worst and most frequent problem (Jinks C et al., 2002) in OA patients that leads to disability (Katz et al., 2006; Tsai and Tak, 2003; Dieppe, 1995), decreased psychosocial health (Khaltaev et al., 2003; Tsai et al., 2003), lower self-efficacy (James et al., 2005), depression (Wolfe and Michaud, 2009; Covic et al., 2006; Dickens et al., 2002) and sleep disturbance (Vitiello, 2009).

Despite available therapies to patients with osteoarthritis, persistent pain and stiffness remains a daily experience (Lawrence et al., 2008). Furthermore, medical and surgical procedures is a high-risk profile particularly for the old patients (Gross and Hillstrom, 2009; Fajardo and Di Cesare, 2005).

Some studies show expressing pain in patients with knee OA is correlated with the patient's disability and performance of daily tasks (Jordan et al., 1997). It has been reported knee pain and disability are two primary concerns in patients with OA (Rosemann et al., 2006). Although, limited joint movement and OA pain may be restricted many activities for patients, disability have different effects Based on joint operation, society culture and the patients' tasks (van Baar et al., 1998).

There is no study in Iran to explore the forms of relationships among pain, demographic characteristics and physical function. Therefore, this study was undertaken to describe the relationship among pain, demographic characteristics and physical function in patients with knee OA. Considering Iranian patients' culture in daily activities. Thus, the nurses can apply support and training programs to improve patients' physical ability and quality of life and to help increasing satisfaction of patients and their families.

MATERIALS AND METHODS

This descriptive, correlational study was conducted among 81 in the knee OA patients referring to Rheumatology clinic depended on Tabriz University of medical science during the period October 2011 through March 2012 in Tabriz, Iran. The participants selected by convenience sampling method.

First, patients were examined by a rheumatologist and if having the inclusion criteria were selected. Inclusion criteria were: (a) patients with age above 35 years and (b) Having idiopathic form of disease, and Exclusion criteria included (a) having other diseases causing pain and disability and (b) having a history of surgery on knee joint.

Data was collected through the Western Ontario and McMaster Universities (WOMAC) questionnaire. The WOMAC was developed for use among patients with knee and / or hip OA, developed by Nicholas Bellamy. The questionnaire copyright was obtained. The instrument items have been ranked on a 5-point Likert-type scale and ordered in three subscales which included pain (5 items), stiffness (2 items) and physical function (17 items). Higher scores on the WOMAC indicate worse pain, stiffness, and functional limitations. Regarding standardization of the instrument, its reliability in previous studies was (0.71-0.90) with Cronbach’s alphas (Bellamy et al., 1988). Overall, results support the internal consistency of the WOMAC subscales. The WOMAC is available in over 85 alternate language forms so, its Persian translation was purchased. Questionnaires were completed with interview, due to low literacy of the majority of participants. Descriptive (number, percent, mean, and standard deviation) and inferential (Regression model) statistics were used to analyze the data in SPSS.

RESULTS AND DISCUSSION

Studying the demographic characteristics of the participants showed that 69 of the participants were married (82.2%) and the educational level of the majority of the participants (87.7%) were secondary level. (Table1).

The mean (standard deviation) age of participants was 57 (30.8). Furthermore, In terms of variables disease characteristics (as duration of disease, comorbidities, Use of assistive devices and Body Mass Index) and the mean (standard deviation) of the outcomes of disease include pain, stiffness and physical function are displayed in table1.

Table2 indicates the results of linear regression analysis to examine the relationship among physical function, pain, stiffness, and the participants’ demographic characteristics. As observed pain, stiffness, and duration of disease were significantly associated with physical function.

The present study aimed to determine the relationship between physical function and pain about knee OA patients. Our results suggested significant relations among physical function, pain, stiffness and duration of disease. Pain and physical disability, the two core indications of knee and hip osteoarthritis (OA), have a major effect on health-related quality of life (HRQoL)(Boutron et al., 2008). Old people are mostly at risk to
osteoarthritis pain, and may be unaware of appropriate treatment choice (Hill and Bird, 2007). Furthermore, the study concluded with Jordan showed expressing pain in patients with knee OA is correlated with the patient's disability and performance of daily tasks (Jordan et al., 1997). Kim and Colleagues (2011) concluded that independent of knee OA and other difficult factors, people with knee pain have more than 5-fold raise in the risk of belonging to the worst lower extremity function compared to people without knee pain. All of these results show that pain, which is the main symptom of osteoarthritis, can be significantly reduced functional ability. Therefore, the pain management in these patients is very important. Nurses can encourage OA patients to do daily physical activity and to participate in society by providing educations about nonpharmacologic pain relief methods.

Table 1. Patients' characteristics and their OA profile

<table>
<thead>
<tr>
<th>variable</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, Mean(SD)</td>
<td>57 (30.8)</td>
</tr>
<tr>
<td>Duration of disease(years), Mean(SD)</td>
<td>6.04 (5.68)</td>
</tr>
<tr>
<td>BMI, Mean(SD)</td>
<td>30.67 (5.54)</td>
</tr>
<tr>
<td>pain, Mean(SD)</td>
<td>11.04 (4.74)</td>
</tr>
<tr>
<td>stiffness, Mean(SD)</td>
<td>4.10 (1.92)</td>
</tr>
<tr>
<td>physical function, Mean(SD)</td>
<td>36.57 (13.52)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>69 (85.2)</td>
</tr>
<tr>
<td>Widowed</td>
<td>12 (14.8)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>26 (32.1)</td>
</tr>
<tr>
<td>Secondary</td>
<td>45 (55.6)</td>
</tr>
<tr>
<td>university</td>
<td>10 (12.3)</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>68 (84)</td>
</tr>
<tr>
<td>Employee</td>
<td>4 (4.9)</td>
</tr>
<tr>
<td>Retired</td>
<td>9 (11.1)</td>
</tr>
<tr>
<td>Use of assistive devices</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3 (3.7)</td>
</tr>
<tr>
<td>No</td>
<td>78 (96.3)</td>
</tr>
<tr>
<td>comorbidities</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>45 (56.3)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>19 (23.8)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>9 (11.2)</td>
</tr>
<tr>
<td>Heart disease</td>
<td>6 (7.5)</td>
</tr>
<tr>
<td>Kidney disease</td>
<td>1 (1.2)</td>
</tr>
</tbody>
</table>

SD= Standard Deviation
BMI= Body Mass Index

Table 2. Linear regression results for relationship among physical functioning, pain, stiffness, and the participants' demographic characteristics

<table>
<thead>
<tr>
<th>variable</th>
<th>B</th>
<th>Std.Error</th>
<th>Beta</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>pain</td>
<td>1.79</td>
<td>0.225</td>
<td>0.62</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>stiffness</td>
<td>0.09</td>
<td>0.55</td>
<td>0.288</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>duration of disease</td>
<td>-0.325</td>
<td>0.143</td>
<td>-0.135</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Dependent variable: physical function; B: Unstandardized Coefficients; Beta: Standardized Coefficients
P-value: <0.05

In addition to pain, stiffness had significantly correlated with physical disabilities. In this regard, Maly and Colleagues (2006) concluded that the feeling of stiffness in osteoarthritis is related with self-efficacy for physical activity, and stiffness also shows a moderate association with physiologic predictors of the risk of falls in older adults(Foley et al., 2006). However, Knee stiffness is an important symptom associated with knee OA and so, health care providers can improve physical activity of OA patients with training muscle strength exercises.

Disease or symptom duration is a important portion in the course of both functional status and pain (Van Dijk et al., 2006). The present study shows an inverse relationship between duration of OA and physical function status. In contrast, in a German study on 1021 hip and knee OA outpatients. Rosemann and Colleagues (2007) could establish a significant direct relation between Disease duration and lower functional ability. This inconsistency might have been caused by difference in mean of participants' age which was low in our study Compared with German study. Probably, Patients in our study regarding age mean, were more motivated to learn about their conditions. So, they could be adjusting with pain and disability at duration of disease with training and exercise.

From these results it can be concluded pain and joint stiffness are important factors that affect the ability to perform activities of daily living in patients with knee OA. Therefore, we suggest that patients become familiar with nonpharmacologic pain relief methods and muscle strengthening exercises to overcome disability from disease.
**Limitations and suggestions**

This study was conducted on a specific care center with low sample size, and the results cannot be generalized to other centers and patients. It was likely that the participants give incorrect answers to the questions. With gaining their trust and explaining about the confidentiality of their answers, this was partly controlled.

Today, educating is an essential part of treating chronic diseases such as osteoarthritis. It is recommended that the medical team pay more attention to training, especially for nonpharmacological methods of pain relief. It is also suggested to perform more qualitative studies on nonpharmacological methods of pain relief which OA patients have successful experiences from their application.

**Conflict of interest**

The authors declare no conflict of interest in this study.

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**Abbreviations**

HRQoL- Health-Related Quality of Life; OA- Osteoarthritis; WOMAC- Western Ontario and McMaster Universities

**REFERENCE**


