Level of Pain and Physical Function in Patient with Chronic Knee Pain Visiting Dhulikhel Hospital
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ABSTRACT

Background
Chronic knee pain is a common and major health problem in ageing population which is also associated with high levels of disability. So early detection and treatment of pain related functional limitation is likely to have major influence on healthy ageing.

Objective
To quantify the level of pain and physical function in patient with chronic knee pain.

Method
Preliminary screening of population with chronic knee pain was taken and cross sectional descriptive study was done. Questionnaire with inclusion criteria was fulfilled with administration of Nepali version of Numerical Pain Rating Scale and Nepali version of Patient Specific Functional Scale on interview as well as self-report basis. Data was collected, recorded and analyzed using Statistical Package for the Social Sciences (SPSS) version 23.

Result
Chronic knee pain was found in 75.6% of female with the average pain level found to be 5 in Nepali version of Numerical pain rating scale. Sitting function was found to be affected in 82.1% of population with mean score of 2 in Nepali version of Patient specific functional Scale. Similarly 80.8% reported going downstairs to be difficult due to knee pain.

Conclusion
Pain and functional disability are the principle findings in patient with chronic knee pain for which they seek medical treatment. So the treatments should target on functional task with effective strategy to address disability. Focus on function is important for the development of optimal rehabilitation programs in patients with chronic knee pain.

KEY WORDS
Assessment, Knee, Osteoarthritis, Pain measurements, Patient outcomes
INTRODUCTION

Pain is defined as unpleasant sensory or emotional disturbance that occurs due to actual or potential tissue damage which is considered to be chronic if the duration is more than 3 months. 1-3 Knee pain is one of the common causes of chronic pain mainly in the older adults. 3,4

In a study done in the Iran, the prevalence of chronic knee pain was found to be 29.97%. 5 Chronic knee pain is commonly due to arthritic change at the tibiofemoral and/or patellofemoral joint. 6,7 Knee being the largest weight bearing joint in our body, is always prone to get overloaded. 8 The maximum compressive force is 25 to 50 % of body weight. 9 The consequence of the altered biomechanics of the knee leads to chronic symptoms. 10,11 Chronic knee pain is associated with functional impairment and is a major health problem common in ageing population. 12,13 So early treatment of pain related functional limitation is likely to have major influence on healthy ageing for adult with chronic knee pain. Functional exercises are regarded in rehabilitation to restore good knee function. 12,13

Pain is the main complaint of people with osteoarthritis and are distressed mainly because of its impact on their physical function. 15,16 It is necessary to identify the impairments associated with reduced function and pain. 17 Identification of the key impairments related to pain and function may assist in delineating physical therapy treatment approaches for patients. 14,15

METHODS

A cross sectional study was designed and data was collected from physiotherapy and orthopedic outpatient department, Dhulikhel hospital. The data collection site was chosen as it receives patients with knee pain from both rural and urban communities with different ethnic background. The data was collected within 2 weeks of times and the study was done within 6 month of time. A total of 78 participants was recruited after calculating sample size for non-probability convenience sampling method for this study. We used the following formula to calculate the sample size.

\[ N = \frac{z^2 p (1-p)}{d^2} \]

Where,

- \( Z \) = desired level of significance (1.96)
- \( p \) = prevalence of chronic knee pain (12.1%)
- \( d \) = precision value (0.07)

Individuals of either gender 18 years and above with knee pain for more than 3 months of period were included. The participants were asked to fill up demographic form with Nepali version of numerical pain rating scale (N-NPRS) and Nepali version of patient specific functional scale. Participants were excluded if they had recent knee surgery, trauma, fractures or malignancy. The data was collected, recorded and analyzed using Statistical Package for the Social Sciences (SPSS) version 23.

This research was conducted after the approval from Institutional Review Committee, Kathmandu University School of Medical Sciences considering the guidelines to conduct research given by Declaration of Helsinki. Written informed consent was obtained from all participants prior to data collection. Verbal consent was obtained if the participants could not sign, and a witness signed on their behalf.

Outcome Measures

We used Nepali version of numerical pain rating scale (NPRS-NP) and Nepali version of patient specific functional scale (PSFS-NP). NPRS is routinely used outcome measure for accessing the pain intensity in daily clinical practice. NPRS-NP demonstrated good construct validity and excellent test-retest reliability. The anchor on the left side corresponds to “no pain” and the anchor at the right side corresponds to the “worst possible pain” or “maximum pain”. It was either patient self-report by patient or administered as face to face interview. 10,21 Patient specific functional scale is identifies the activities that are most important to them and rate them in a scale of 0 to 10 where higher score shows the better physical function. The advantages of using PSFS are wide applicability and ease of use clinically. PSFS-NP showed good reliability with cronbach’s alpha = 0.75; ICC = 0.89. 22

RESULTS

Data were collected from the 78 participants. Descriptive statistics of the demographic characteristics are illustrated in table 1. The mean age of the patient was 52.59±14.98 years. More than 3/4th of the participants with chronic knee pain were female. Among 78 participants 80.8% of them were illiterate and 46.2% of them were farmers. Most of the participants were from newar community (37.2%). Chronic knee pain was found to be more in illiterate female patients who were mostly farmer. Bilateral knee pain was found to be prevalent in 59% of the patient with mean duration of 20 month.

Table 2 shows the functional level of the population where sitting function was found to be affected in 82.1% of population with mean PSFS score of 2. Similarly carrying load was found to be the most difficult task with PSFS score of 1. Mean pain level of patient with chronic knee pain in numerical pain rating scale was 5 with maximum score of 7 and minimum score of 2.

DISCUSSION

The study shows sitting function was mostly affected in 82.1% of population with mean PSFS score of 2. Similarly carrying load was the most difficult task with mean PSFS
score of 1. 80.8% of them reported going downstairs to be difficult due to knee pain with PSFS score of 2. Going upstairs was found to be difficult for 74.4% with PSFS score of 3. In our study functional activities that require mobility was affected which is supported in the published literature. Studies reported joint pain especially chronic knee pain is the frequent cause of limitation of function among the older adults and significantly associated with marked mobility disability.

The results of this study suggest that chronic knee pain were more prevalent in females compared to males which are similar to global prevalence. This type of finding warrants the sex specific preventive measures and management of chronic knee pain. Studies have indicated that individuals in the older age group perform less functional activities than younger counterparts. This will lead to muscle dysfunction and finally osteoarthritis of knee. During weight bearing activities such as going up and down, sit to stand increase the tibiofemoral and patello-femoral joint compressive forces leading to greater pain and thus rendering task performance difficult. Diminished quadriceps strength is an important determinant of functional loss. Thus, it was predicted that functional ability will be more strongly affected in the presence of both proprioceptive inaccuracy and muscle weakness.

Mean pain level of patient with chronic knee pain in Nepali version of Numerical Pain Rating scale was 5 with maximum NPRS score 7 and minimum score of 2. The main cause of chronic knee pain in following study shows knee osteoarthritis which is consistent with the similar study that has been done in Iran. To the best of our knowledge no prior study has been done about pain level in chronic knee pain using the NPRS scale; thus a direct comparison of present findings with the other studies couldn’t be made. One study reported the baseline score of pain of people with Knee osteoarthritis to be 5.1 in Numerical rating scale which is expressed in a scale of 0 to 10. Combination of tibiofemoral and patello-femoral pain was associated with greater self-reported pain. It has also been stated in literature that the specific site of cartilage destruction within a joint might explain the presence of pain at rest and/or movement. The difference in pain between individual can be due different factors like age and gender. There are studies suggesting that and the structural damage and the psychological factors were the leading causes of pain.

CKP was more prevalent in females. This type of finding warrants the sex specific preventive measures and management of chronic knee pain. Although this study didn’t considered the level of pain during rest or movement, previous studies shows chronic knee pain during rest and movements to be 2 and 7 respectively in Visual analogue scale (VAS).

Table 1. Demographic characteristics of sample (N=78)

| Characteristics            | N   | Percentage |
|---------------------------|-----|------------|
| Sex                       |     |            |
| Male                      | 19  | 24.4       |
| Female                    | 59  | 75.6       |
| Educational status        |     |            |
| Illiterate                | 63  | 80.8       |
| Primary                   | 7   | 9.0        |
| Secondary                 | 6   | 7.7        |
| Bachelor and above        | 2   | 2.6        |
| Occupation                |     |            |
| Farmer                    | 36  | 46.2       |
| Business                  | 7   | 9          |
| Student                   | 4   | 5.1        |
| Housewife                 | 26  | 33.3       |
| Unemployed                | 2   | 0.6        |
| Others                    | 3   | 3.8        |
| Ethnicity                 |     |            |
| Brahmin                   | 23  | 29.5       |
| Newar                     | 5   | 37.2       |
| Chhetri                   | 29  | 6.4        |
| Tamang                    | 12  | 15.4       |
| Others                    | 9   | 11.5       |
| Side of Knee Pain         |     |            |
| Right                     | 25  | 32.0       |
| Left                      | 7   | 9.0        |
| Bilateral                 | 46  | 59.0       |
| Duration of knee pain     | Mean (standard deviation) | Range |
| Months                    | 20.09 (22.43) | 4-96  |
| Age                       | Mean (standard deviation) | Range |
| Years                     | 52.59 (14.98) | 18-82 |

Table 2. PSFS and NPRS Findings (N=78)

| Activities                  | N     | Percentage | PSFS score (average) |
|-----------------------------|-------|------------|----------------------|
| Sitting                     | 64    | 82.1       | 2                    |
| Going downstairs            | 63    | 80.8       | 2                    |
| Going upstairs              | 58    | 74.4       | 3                    |
| Sit to stand                | 51    | 65.4       | 2                    |
| Walking                     | 48    | 61.5       | 3                    |
| Toileting                   | 47    | 60.3       | 2                    |
| Prolong standing            | 32    | 41.0       | 3                    |
| Carry load                  | 10    | 12.8       | 1                    |
| Bending                     | 1     | 1.3        | 4                    |

| NPRS Findings               | Male  | Female | Total |
|-----------------------------|-------|--------|-------|
| Mean (Standard deviation)   |       |        |       |
| [range]                     |       |        |       |
| 5.15±(±1.03)                | [2.3-7]|
| 5.12±(±1.04)                | [2-7.33]|
| 5.1±(±1.04)                 | [2-7]  |

First the study is a cross sectional study design so no casual conclusions can be drawn from the study results.
Secondly, the association of pain and function was not analyzed. Psychological variables and health related beliefs are important determinants of functioning which was not analyzed in this study which is another potential limitation of the study.

CONCLUSION

Pain and functional limitation was main finding among the population with chronic knee pain. Regarding function, sitting function was mainly hampered. Along with this sit to stand, walking in upstairs and downstairs were also significantly affected. Knee osteoarthritis was the main cause of CKP. Proper functional rehabilitation protocol is necessary for such population. Older age group was found with more pain as well as functional problem. So the functional rehabilitation should have focus on the older age group. To conclude knowledge of functional consequences is essential for development of optimal rehabilitation programs inpatient with CKP. Identification of the key impairments related to pain and function may assist in delineating physical therapy treatment approaches for patients with CKP.

Factors like medication, depression might have influenced the self-reported functional limitation of participants. So further study should be done regarding these factors.

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