

# 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.<sup>1-3</sup> Knee pain is one of the common causes of chronic pain mainly in the older adults.<sup>3,4</sup>

In a study done in the Iran, the prevalence of chronic knee pain was found to be 29.97%.<sup>5</sup> Chronic knee pain is commonly due to arthritic change at tibiofemoral and/or patellofemoral joint.<sup>6,7</sup> Knee being the largest weight bearing joint in our body, is always prone to get overloaded.<sup>8</sup> The maximum compressive force is 25 to 50 % of body weight.<sup>9</sup> The consequence of the altered biomechanics of the knee leads to chronic symptoms.<sup>10,11</sup> Chronic knee pain is associated with functional impairment and is a major health problem common in ageing population.<sup>12-14</sup> 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.<sup>12,13</sup>

Pain is the main complain of people with osteoarthritis and are distressed mainly because of its impact on their physical function.<sup>15,16</sup> It is necessary to identify the impairments associated with reduced function and pain.<sup>17</sup> Identification of the key impairments related to pain and function may assist in delineating physical therapy treatment approaches for patients.<sup>18,19</sup>

## 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.

$$N = z^2 p (1-p) / d^2$$

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.<sup>20,21</sup> Patient specific functional scale 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.<sup>22</sup>

## 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 3/4<sup>th</sup> 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

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

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

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.<sup>23-26</sup> The results of this study suggest that chronic knee pain were more prevalent in females compared to males which are similar to global prevalence.<sup>27</sup>

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.<sup>5</sup> 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

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

	N	Percentage	PSFS score (average)
<b>Activities</b>			
Sitting	64	82.1	2
Going downstairs	63	80.8	2
<b>Going upstairs</b>	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
<b>NPRS Findings</b>			
	<b>Male</b>	<b>Female</b>	<b>Total</b>
Mean (Standard deviation)	5.15(±1.03)	5.12(±1.04)	5.1(±1.04)
[range]	[2.3-7]	[2-7.33]	[2-7]

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.<sup>10</sup> 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.<sup>28</sup> The difference in pain between individual can be due different factors like age and gender.<sup>12</sup> There are studies suggesting that and the structural damage and the psychological factors were the leading causes of pain.<sup>13</sup> 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).<sup>29</sup>

CKP was more prevalent in females.<sup>27</sup> This type of finding warrants the sex specific preventive measures and management of chronic knee pain.<sup>30</sup> Studies have indicated that individuals in the older age group perform less functional activities than younger counterparts.<sup>31</sup> 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 patellofemoral joint compressive forces leading to greater pain and thus rendering task performance difficult.<sup>32</sup> 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.<sup>33</sup>

It is necessary to focus on the functional consequence which is important because knowledge of functional consequences is essential for development of optimal rehabilitation programs inpatient with CKP.<sup>32</sup>

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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## REFERENCES

- Loeser JD, Treede RD. The Kyoto protocol of IASP Basic Pain Terminology. *Pain*. 2008 Jul 31;137(3):473-7. doi: 10.1016/j.pain.2008.04.025. Epub 2008 Jun 25. PMID: 18583048.
- Debono DJ, Hoeksema LJ, Hobbs RD. Caring for patients with chronic pain: pearls and pitfalls. *J Am Osteopath Assoc*. 2013 Aug;113(8):620-7. doi: 10.7556/jaoa.2013.023. PMID: 23918913.
- Nicholas M, Vlaeyen JWS, Rief W, Barke A, Aziz Q, Benoliel R. et al. IASP Taskforce for the Classification of Chronic Pain. The IASP classification of chronic pain for ICD-11: chronic primary pain. *Pain*. 2019 Jan;160(1):28-37. doi: 10.1097/j.pain.0000000000001390. PMID: 30586068.
- Jinks C, Jordan K, Croft P. Osteoarthritis as a public health problem: the impact of developing knee pain on physical function in adults living in the community: (KNEST 3). *Rheumatology (Oxford)*. 2007 May;46(5):877-81. doi: 10.1093/rheumatology/kem013. Epub 2007 Feb 17. PMID: 17308312.
- Noormohammadpour P, Mansournia MA, Koochpayehzadeh J, Asgari F, Rostami M, Rafei A, et al. Prevalence of Chronic Neck Pain, Low Back Pain, and Knee Pain and Their Related Factors in Community-Dwelling Adults in Iran: A Population-based National Study. *Clin J Pain*. 2017 Feb;33(2):181-7. doi:10.1097/AJP.0000000000000396. PMID: 27258995.
- Hosny S, McClatchie W, Sofat N, Hing CB. Knee Pain in Adults and Adolescents, Diagnosis and Treatment. *Pain in Perspective*. 2012 Oct 24;DOI 10.5772/51077
- Rathleff, Michael S., and Bill Vicenzino. Patellofemoral Joint Pain, fact sheet. *International association for study of pain*. 2016.
- Murase K, Tabara Y, Ito H, Kobayashi M, Takahashi Y, Setoh K, et al. Knee Pain and Low Back Pain Additively Disturb Sleep in the General Population: A Cross-Sectional Analysis of the Nagahama Study. *PLoS One*. 2015 Oct 7;10(10):e0140058. doi: 10.1371/journal.pone.0140058. PMID: 26444713; PMCID: PMC4622045.
- Magee DJ. Orthopedic physical assessment. Elsevier health Sciences. 2013 Dec 4 ; chapter 11:427-8.
- Lohmander LS, Ostenberg A, Englund M, Roos H. High prevalence of knee osteoarthritis, pain, and functional limitations in female soccer players twelve years after anterior cruciate ligament injury. *Arthritis Rheum*. 2004 Oct;50(10):3145-52. doi: 10.1002/art.20589. PMID: 15476248.
- Englund M, Niu J, Guermazi A, Roemer FW, Hunter DJ, Lynch JA, et al. Effect of meniscal damage on the development of frequent knee pain, aching, or stiffness. *Arthritis Rheum*. 2007 Dec;56(12):4048-54. doi: 10.1002/art.23071. PMID: 18050201.
- Farrokhi Shawn, Chen Fan Yi, Piva R Sara, Fitz K. G Gerald, Jong Hyeon Jeong, C. Kent Kwoh. The influence of knee pain location on symptoms, functional status and knee-related quality of life in older adults with chronic knee pain. *Clinical journal of pain*. 2017; 32(6):463-70.
- van Dijk GM, Dekker J, Veenhof C, van den Ende CH; Carpa Study Group. Course of functional status and pain in osteoarthritis of the hip or knee: a systematic review of the literature. *Arthritis Rheum*. 2006 Oct 15;55(5):779-85. doi: 10.1002/art.22244. PMID: 17013827.
- Kshetri Dan. Knee pain and knee pain related disability in adults of the Western Development Region of Nepal. PhD thesis. Preston: University of central Lancashire;2017
- Werner S. Anterior knee pain: an update of physical therapy. *Knee Surg Sports Traumatol Arthrosc*. 2014 Oct;22(10):2286-94. doi: 10.1007/s00167-014-3150-y. Epub 2014 Jul 6. PMID: 24997734.
- Hawker G. Assessing joint pain and function in the clinic. International association of pain. 2016
- Piva SR, Fitzgerald GK, Irrgang JJ, Fritz JM, Wisniewski S, McGinty GT, et al. Associates of physical function and pain in patients with patellofemoral pain syndrome. *Arch Phys Med Rehabil*. 2009 Feb;90(2):285-95. doi: 10.1016/j.apmr.2008.08.214. PMID: 19236982; PMCID: PMC4876957.
- Rosenbloom BN, Rabbitts JA, Palermo TM. A developmental perspective on the impact of chronic pain in late adolescence and early adulthood: implications for assessment and intervention. *Pain*. 2017 Sep;158(9):1629-32. doi: 10.1097/j.pain.0000000000000888. PMID: 28267063; PMCID: PMC5561523.
- Monticone M, Ferrante S, Rocca B, Salvaderi S, Fiorentini R, Restelli M et al. Home-based functional exercises aimed at managing kinesiophobia contribute to improving disability and quality of life of patients undergoing total knee arthroplasty: a randomized controlled trial. *Arch Phys Med Rehabil*. 2013 Feb;94(2):231-9. doi: 10.1016/j.apmr.2012.10.003. Epub 2012 Oct 12. PMID: 23063624.

20. Castarlenas E, Jensen MP, von Baeyer CL, Miró J. Psychometric Properties of the Numerical Rating Scale to Assess Self-Reported Pain Intensity in Children and Adolescents: A Systematic Review. *Clin J Pain*. 2017 Apr;33(4):376-83. doi: 10.1097/AJP.0000000000000406. PMID: 27518484.
21. Sharma S, Palanchoke J, Abbott JH. Cross-cultural Adaptation and Validation of the Nepali Translation of the Patient-Specific Functional Scale. *J Orthop Sports Phys Ther*. 2018 Aug;48(8):659-64. doi: 10.2519/jospt.2018.7925. Epub 2018 Apr 6. PMID: 29625533.
22. Alghadir AH, Anwer S, Iqbal A, Iqbal ZA. Test-retest reliability, validity, and minimum detectable change of visual analog, numerical rating, and verbal rating scales for measurement of osteoarthritic knee pain. *J Pain Res*. 2018 Apr 26;11:851-6. doi: 10.2147/JPR.S158847. PMID: 29731662; PMCID: PMC5927184.
23. Cottrell E, Roddy E, Foster NE. The attitudes, beliefs and behaviours of GPs regarding exercise for chronic knee pain: a systematic review. *BMC Fam Pract*. 2010 Jan 18;11:4. doi: 10.1186/1471-2296-11-4. PMID: 20082694; PMCID: PMC2826301.
24. Dunlop DD, Lyons JS, Manheim LM, Song J, Chang RW. Arthritis and heart disease as risk factors for major depression: the role of functional limitation. *Med Care*. 2004 Jun;42(6):502-11. doi: 10.1097/01.mlr.0000127997.51128.81. PMID: 15167318.
25. Tichonova A, Rimdeikienė I, Petruševičienė D, Lendraitienė E. The relationship between pain catastrophizing, kinesiophobia and subjective knee function during rehabilitation following anterior cruciate ligament reconstruction and meniscectomy: A pilot study. *Medicina (Kaunas)*. 2016;52(4):229-37. doi: 10.1016/j.medici.2016.07.005. Epub 2016 Aug 11. PMID: 27623044.
26. Agalotiis M, Mackey MG, Jan S, Fransen M. Burden of reduced work productivity among people with chronic knee pain: a systematic review. *Occup Environ Med*. 2014 Sep;71(9):651-9. doi: 10.1136/oemed-2013-101997. Epub 2014 May 28. PMID: 24872332.
27. Cross M, Smith E, Hoy D, Nolte S, Ackerman I, Fransen M et al. The global burden of hip and knee osteoarthritis: estimates from the global burden of disease 2010 study. *Ann Rheum Dis*. 2014 Jul;73(7):1323-30. doi: 10.1136/annrheumdis-2013-204763. Epub 2014 Feb 19. PMID: 24553908.
28. Lundblad H, Kreicbergs A, Jansson KA. Prediction of persistent pain after total knee replacement for osteoarthritis. *J Bone Joint Surg Br*. 2008 Feb;90(2):166-71. doi: 10.1302/0301-620X.90B2.19640. PMID: 18256082.
29. Takahashi A, Kitamura K, Watanabe Y, Kobayashi R, Saito T, Takachi R, et al. Epidemiological profiles of chronic low back and knee pain in middle-aged and elderly Japanese from the Murakami cohort. *J Pain Res*. 2018 Dec 12;11:3161-3169. doi: 10.2147/JPR.S184746. PMID: 30588068; PMCID: PMC6296201.
30. Hortobágyi T, Garry J, Holbert D, Devita P. Aberrations in the control of quadriceps muscle force in patients with knee osteoarthritis. *Arthritis Rheum*. 2004 Aug 15;51(4):562-9. doi: 10.1002/art.20545. PMID: 15334428.
31. Dekker J, van Dijk GM, Veenhof C. Risk factors for functional decline in osteoarthritis of the hip or knee. *Curr Opin Rheumatol*. 2009 Sep;21(5):520-4. doi: 10.1097/BOR.0b013e32832e6eaa. PMID: 19550331.
32. Pisters MF, Veenhof C, van Dijk GM, Heymans MW, Twisk JW, Dekker J. The course of limitations in activities over 5 years in patients with knee and hip osteoarthritis with moderate functional limitations: risk factors for future functional decline. *Osteoarthritis Cartilage*. 2012 Jun;20(6):503-10. doi: 10.1016/j.joca.2012.02.002. Epub 2012 Feb 10. PMID: 22330176.
33. van der Esch M, Steultjens M, Harlaar J, Knol D, Lems W, Dekker J. Joint proprioception, muscle strength, and functional ability in patients with osteoarthritis of the knee. *Arthritis Rheum*. 2007 Jun 15;57(5):787-93. doi: 10.1002/art.22779. PMID: 17530678.