Musculoskeletal Symptoms in adults in Kathmandu Metropolitan City: A Household survey

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Abstract

Objective: - To obtain information about musculoskeletal symptoms (MSS) in Kathmandu Metropolitan City (KMC), Nepal.

Method: - A descriptive cross-sectional study was performed in KMC. There are 35 different wards (areas) in the KMC and wards were chosen using 'probability proportional to size' cluster technique. It was decided to have 30 clusters, 24 wards were selected out of 35 wards (as some wards had more than one cluster) and 22 individuals were interviewed from each cluster. In each selected ward, one roundabout at the center of the ward was chosen at random. At each roundabout, the direction was chosen at random and then the first 22 households in that direction were interviewed. A structured interview was performed based on standardized instruments; a standardized Nordic questionnaire (SNQ) was used to obtain information about MSS and to obtain information on functional ability (COOP-WONCA) charts were used. Also demographic data was collected.

Result: - Six hundred and sixty six persons were interviewed. According to the body part the four most commonly reported regions with musculoskeletal symptom were low back (37.7%), knee (27.0%), ankle (14.8%) and wrist and hand (9.1%) during the previous 12 months. Similarly according to the body parts the four most commonly reported regions with musculoskeletal symptoms in the last 7 days were low back (26.8%), knee (19.4%) and ankle (10.0%). After adjusting for age, BMI and smoking the prevalence of musculoskeletal symptoms were higher in females than in male in all different body parts. Prevalence of musculoskeletal symptoms was higher in those aged above 36 years and in those who had low functional ability. Prevalence of shoulder, elbow, wrist/hand, upper back, lower back, hip, knee and ankle/foot symptoms were significantly higher in persons with low physical fitness than the persons with normal physical fitness. Among person with low physical fitness

prevalence of back symptoms and knee symptoms were 38 and 51 percentage respectively. Prevalence of shoulder, elbow, wrist/hand, upper back, lower back, hip, knee and ankle/foot symptoms were significantly higher in persons with low daily activity and low social activity than the persons with normal daily activity and normal social activities. Prevalence of shoulder, elbow, wrist/hand, upper back, lower back, hip and knee symptoms were significantly higher in persons with low score on feelings than the persons with normal feelings. In this study, 272 (59.1%) of the individuals did not seek any medical healthcare when they had musculoskeletal symptoms whereas 154 (33.5%) went to doctor, 17 (3.7%) went to doctor and physiotherapist, 5 (1.1%) went to physiotherapist, 5 (1.1%) went for Ayurvedic (treatment with medicinal plant) treatment, 3 (0.7%) went to traditional healer and 3 (0.7%) went to doctor and traditional healer when they had musculoskeletal symptoms.

Conclusion: - This study adds to the knowledge about musculoskeletal symptoms in the general population in KMC. Prevalence of symptoms from low back and knees are most common in general population of KMC. Musculoskeletal symptoms are more common among females than males and more common among those aged above 36 years and among those reporting low functional ability. The healthcare involved in the treatment of persons with MSS should be explored further in the Nepal population, to find the causes of these problems and proper methods for prevention.

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Acronyms and Abbreviations

KMC = Kathmandu metropolitan city

MSS= Musculoskeletal symptoms

COOP\WONCA = Care Cooperative\World Organisation of Colleges, Academies and Academic Association of General Practitioners/Family Physicians (In relation to the chart used in the study to collect data on functional ability)

SNQ = Standardised Nordic Questionnaire

WOMAC = Western Ontario and McMaster osteoarthritis Index

BPI = Brief Pain inventory

REK = Regional committee for medical and health research ethics

NHRC = Nepal Health Research Council

BMI = Body mass index

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1. Introduction

1.1 Global issue on musculoskeletal conditions

Musculoskeletal conditions are one of the global health problems due to increase of aging population and also due to change in environment and lifestyle (1). Several studies have suggested that musculoskeletal symptoms are becoming more common in developing countries (2-5). There are relatively less data available on musculoskeletal symptoms in low-income countries than in high income countries (6, 7). The studies which have been carried out in low-income countries most often included only young population neglecting old age group which led to data giving a relatively inaccurate estimation of burden of musculoskeletal disease in these countries (6).

1.2 Different terms and definitions

Musculoskeletal system includes bone, tendons, nerves and supporting structures of the body. There are different types of musculoskeletal diseases/injuries/conditions affecting the joint, muscles, bones, cartilages, ligaments and other supporting structures.

When discussing diseases or problems in musculoskeletal system, a number of expressions are used in different studies such as musculoskeletal problems, musculoskeletal conditions, musculoskeletal symptoms or musculoskeletal disorders, and the expressions differ from study to study. The musculoskeletal disease/injuries/conditions include conditions which can last for short duration or that can last lifelong; these lifelong lasting musculoskeletal disease/injuries/conditions include rheumatoid arthritis, low back pain, osteoarthritis, osteoporosis etc. The musculoskeletal disease/injuries/conditions not only affects the psychological status of the affected person but also those around them and it can also lead to long term physical disability and pain in the affected person (1).

The common symptoms of all the musculoskeletal diseases/injuries/conditions are pain, ache, stiffness, discomfort, tingling or burning sensation in the musculoskeletal system along with joint swelling, limitation in the joint movement and limitation in the activities of daily living. So in order to capture the musculoskeletal disease/injuries/conditions most of the valid and reliable questionnaires so far have used these symptoms. Most of the questionnaires have used some or all of the symptoms or terms to collect data on musculoskeletal diseases/injuries/conditions from the general population.

In an epidemiological study it is not practical to use clinical definition of all the different musculoskeletal disease/injuries/conditions/problems while collecting data from the general population through a questionnaire interview because it requires thorough history taking, clinical examination, laboratory examination and radiological examination to diagnose a disease in the musculoskeletal system, and also it requires high degree of cost and time.

Study done in aluminum plant have used two terms or symptoms (pain and discomfort) to capture the musculoskeletal symptoms from different parts of the body (8). Another study done in visual display terminal have used pain, numbness and stiffness to collect data on the musculoskeletal symptoms from upper part of the body (9). A study carried out in United Kingdom used only one term i.e. pain to collect data on musculoskeletal symptoms from different parts of the body (10). Another study carried out on the aluminum plant used terms such as pain, ache and discomfort to collect data on musculoskeletal symptoms (11). Even though there are different terms used to collect data on musculoskeletal symptoms we have decided to use pain, ache and discomfort as defined in standardized Nordic questionnaire (12). So, in this study musculoskeletal symptoms are defined as pain, ache and discomfort in different parts of the body.

1.3 Prevalence of musculoskeletal symptoms

Data on musculoskeletal symptoms from general population are very less which was mentioned in framework for the Bone and joint Decade(13) and most data are from specific working population(11) or from a particular anatomical site (14) but the population based data on musculoskeletal symptoms from different anatomical sites are less. The epidemiological data on musculoskeletal symptoms are very less in Nepal (15). A study conducted in northwestern region of England which compared prevalence of musculoskeletal pain between 1950s and 2005 using the historical data collection method in which they compared two cross sectional studies conducted 40 years apart and found that there was increased prevalence of musculoskeletal pain by two to four fold (16). This shows that the prevalence of musculoskeletal symptoms is increasing in the general population of developed country which should be the same in developing country like Nepal. In 2005 a study carried out in the general population of Italy it was found that musculoskeletal conditions are very common and the estimated prevalence was 26.7% which was significantly higher in women than men ($p<0.0001$) (17). Three most common self-reported musculoskeletal pain in Dutch general population are low back pain (26.9%), shoulder pain (20.9%) and neck pain (20.6%) and also the prevalence was higher among women than men (18). A population based study conducted in UK reported that the most common site of musculoskeletal pain in the UK population was back (23%), knee (19%), and shoulder (16%) (10). In Kuwaiti population the most common source to seek advice for treatment for their musculoskeletal symptoms were physicians in hospital (68.8%) and general practitioners (30.4%) (19). A study conducted in Iran on musculoskeletal pain in the last 7 days found that knee pain (25.5%) was the most common followed by dorso-lumbar pain (22.9%), shoulder pain (15.3%) and cervical pain (14.1%) (20). The most common musculoskeletal complaints (last 7 days) in an Indian population based study were neck (6%), lumbar (11.4%), shoulder (7.4%), elbow (6.5%), wrist (6.4%),

hand (6.1%), knees (13.2%), calf (6.6%), and ankle (6.5%) and the prevalence was higher at all body parts among women than men; at some painful sites women reported 2-3 times more than men (21). The most common musculoskeletal complains in urban Vietnam population were knee pain (18.2%), low back pain (11.2%) and soft tissue disorders (15.4%) (3). The four most common musculoskeletal complain reported in Thailand were back (22.7%), knee (12.5%), hip (6.5%) and neck (5%) (22). Table 1 shows the prevalence of musculoskeletal symptoms in different countries. A observational study carried out in the Spanish population concluded that the Spanish have medium level of knowledge on musculoskeletal disease but the knowledge level varied depending on the social and demographic factor as well as if the individual have had direct or indirect experience of what exactly is musculoskeletal disease (23).

Table 1 Prevalence of musculoskeletal symptoms in different parts of the body in different countries

Site of musculoskeletal complain	Netherlands (18)	United Kingdome (10)	Iran(20)	India(21)	Vietnam (3)	Thailand (22)
Neck	20.6%	14%	-	6%	-	5%
Cervical			13.4%	-	-	-
Shoulder	20.9%	16%	14.5%	7.4%	-	-
Elbow	7.5%	6%	6.7%	6.5%	-	-
Wrist	-	-	10%	6.4%	-	-
Hand	-	12%	9.4%	6.1%	-	-
Wrist/hand	12.5%		-	-	-	-
Back	-	23%	-	-	-	22.7%
Upper back	9.1%	-	-	-	-	-
Lower back	26.9%	-	-	-	11.2%	-
Lumbar	-		-	11.4%	-	-
Dorso-lumbar pain			21.7%		-	-
Hip	9.1%	9%	7.1%	1%	-	6.5%
Knee	15.2%	19%	25.5%	13.2%	18.2%	12.5%
Ankle	4.9%	-	9.8%	6.5%	-	-
Heel	6.5%	-	-	2.7%	-	-
Sole	-		-	2.1%	-	-
Foot	-	-	-	1.4%	-	-
Toes			6.1%		-	-

In a household survey conducted in Kota, Nepal it was found that 53.5 percent reported at least one member of the household had some form of active bone or joint problem (24). Back pain was four times more prevalent than all orthopedic and rheumatic problems of the

extremities combined (24). In the same study from rural Nepal it was found that 47.9 percent of the members of the households in rural Nepal had back or neck problem while only 12.7 percent had problem in the extremities (head, face, shoulder or hip) (24). In the study conducted in Kota, Nepal it was found that there was no significant differences in bone and joint disorders between gender, caste and hamlet within the community (24). There is very little knowledge about musculoskeletal symptoms in general population of Nepal (5, 14). For instance how many people are suffering from musculoskeletal disorders? Which musculoskeletal disorder is most common among general population of Nepal? What do people do when they get musculoskeletal problems? Healthcare seeking behavior among people with musculoskeletal disorders is still unknown. One of the studies carried out in rural part of Nepal found that musculoskeletal pain was one of the common complaints (5). To answer the questions about prevalence, research on musculoskeletal symptoms is needed in the general population of Nepal.

1.4 Consequences of musculoskeletal symptoms in Nepal

Musculoskeletal symptoms are causing workers to take medical leaves from work and also causing long-term work disability (25). When it comes to health seeking behavior, a study has shown that Nepalese living in rural part of Nepal with mild illness treat this at home, where as those with moderate or severe illness seek health care from traditional healer first before seeking health care from health workers (26).

1.5 Functional ability

Functional ability or functional status can be defined as the ability to perform different types of activities that are considered to be normal for those people who are healthy (27). Functional ability may be categorized in five different categories: i) physical activities

(walking, running, using stairs etc.), ii) self-care activities (dressing, bathing, feeding etc.), iii) mobility (getting around indoors, outdoors or in the community), iv) leisure activities (sports, hobbies etc.), v) role activities (specific for the person of particular age and social role, for instance work, household activities and school) (27). A study carried out in Ullensaker municipality, Norway it was reported that there was increase in the functional problem with increase in the number of pain site (28). Another study conducted at the outpatient department in primary care suggested that the physical symptoms had high association with functional status and with the increase in the number of physical symptoms there was decrease in the functional status (29).

1.6 Risk factors

Musculoskeletal symptoms are directly related to array of physical activities that puts musculoskeletal system on stress (30). Musculoskeletal symptoms are often related with repetitive work nature, long static posture, long working hour, awkward posture and poor work ergonomics (31-33). Physical factors (e.g. lifting activities with hands, lifting weight at or above shoulder height, pulling or pushing weights, squatting, standing, repetitive movements with the hands, awkward long static posture), psychosocial factors (e.g. job demands, job control , social support from colleagues and supervisors at work) along with individual factors (education level, leisure time physical activities, body mass index, fear avoidance beliefs) and health related factors (diabetes, depression, migraine, hypertension, chronic bronchitis, rheumatic diseases and other somatic disease) are related to the musculoskeletal symptoms (34). Musculoskeletal symptoms are also found to be associated with psychosocial factors and work organizational factors (35). A systematic review on longitudinal studies suggested that there are reasonable evidence that heavy physical work, smoking, high body mass index, high psychosocial work demand and presence of co-

morbidities are the risk factors of musculoskeletal disorders and other common risk factors are excessive repetition, awkward posture and heavy lifting (36). A systematic literature review on psychological factors that can lead to back and neck pain reported that psychological factors (stress, distress or anxiety as well as mood and emotions, cognitive functioning and pain behavior) play key role in chronic and acute pain specially in the transition to the chronic problems and it was also reported that personality factor had mixed result in the development of pain (37). A cross sectional study carried out at factories in Mumbai, Indian and in UK found out that there was impact of culture on musculoskeletal complains (38). The prevalence of musculoskeletal symptoms such as pain in joints or pain in legs were found to be increased with increase in age (39). A study reported an association between body mass index and musculoskeletal symptoms especially from lower extremities (40). Numbers of observational studies carried out in general population have reported that there is association between smoking and musculoskeletal symptoms (41-43).

The numerous risk factors such as physical, psychological and social factors which can lead to musculoskeletal symptoms show the importance of considering these factors in treatment of musculoskeletal symptoms (Bio-psychosocial concept of illness)(44, 45).

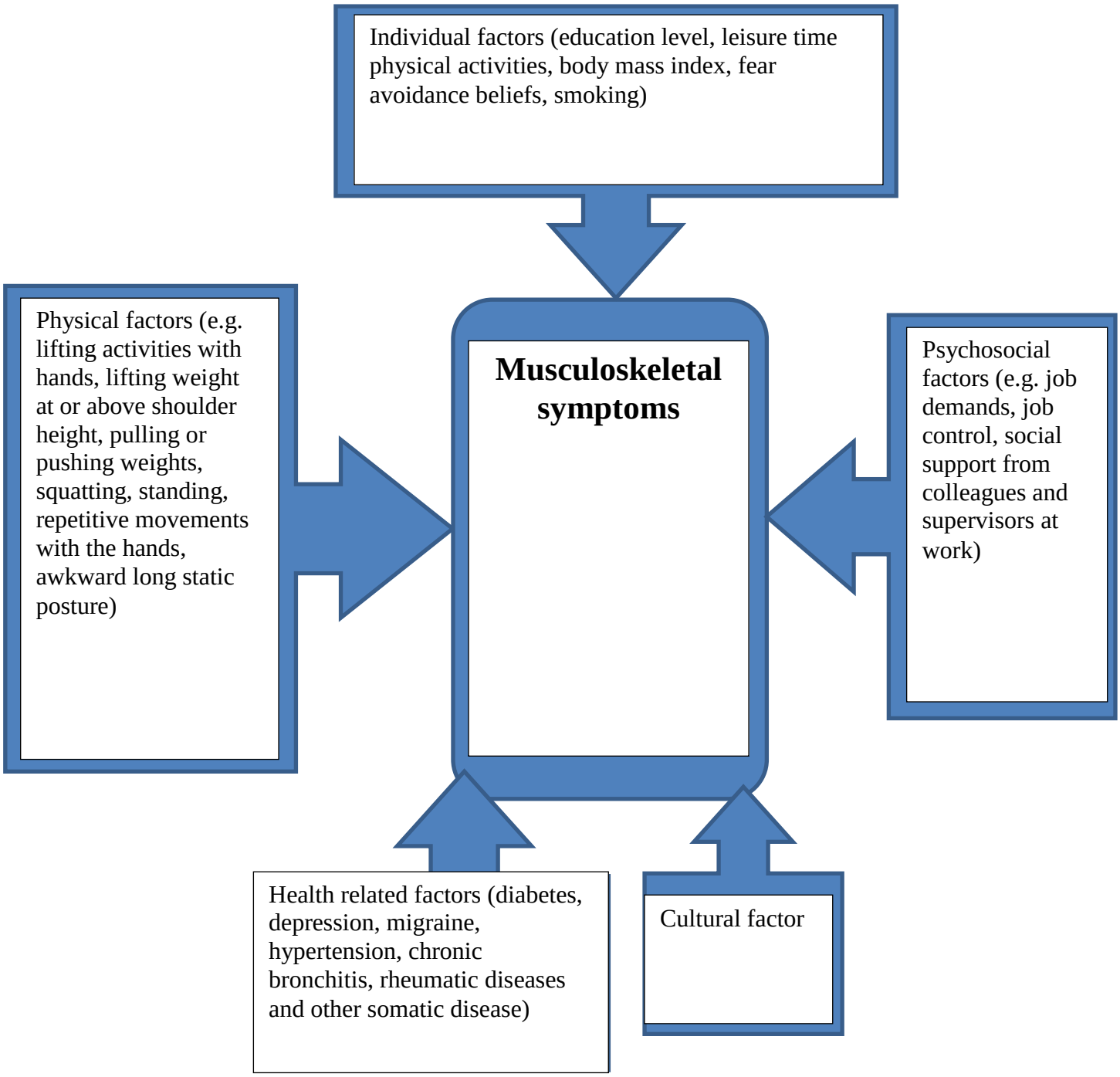

Fig 1 Different risk factor of musculoskeletal symptoms

Risk factors of back or neck pain in rural Nepal were reported as fall from the high places (e.g. falling from tree or roof top), carrying load supported by a tumpline passing over the top

of head, working on agricultural field with short-handle hoe and short-handle shovel, sweeping with whiskbroom (local version) which needs bending for proper use, grinding flour each day by bending over a heavy stone millstone which is rotated by grasping a short handle with both hands and turning it in horizontal plane, husking cereals by using foot-pedal mortar, squatting, sitting and standing daily over the hearth to stir food while cooking, squatting on river stones to wash all family members' clothes and using axe to cut trees to useful length for firewood or for building materials (24).

1.7 Rationale

There is little knowledge on musculoskeletal burden of disease in Asia. These problems are huge in other parts of the world and it is likely that this is the case also in Asian countries like Nepal. Gaining more information on this topic in Nepal might help the local government and health personnel in health priority setting.

1.8 Objective

General objectives

1) To obtain information about musculoskeletal symptoms in Kathmandu Metropolitan City, Nepal.

Specific objective

1) To estimate the prevalence of musculoskeletal symptoms in an adult population in Kathmandu Metropolitan City.
2) To identify the association between gender and musculoskeletal symptoms.
3) To identify the association between age and musculoskeletal symptoms.
4) To identify the association between functional ability and musculoskeletal symptoms.
5) To explore the health care seeking behavior in case of musculoskeletal symptoms.

2. Methods and materials

2.1 Study Design

This research was a descriptive cross-sectional study in Kathmandu Metropolitan city, situated in Kathmandu district, Kathmandu, Nepal. Data was collected in six days from 5th of December till 10th of December 2013 by four data collectors and principle investigators. A sample which would represent Kathmandu metropolitan city is chosen using 'probability proportional to size' cluster technique. Thirty clusters were chosen from Kathmandu metropolitan city using PPS method. Clusters are the wards from the Kathmandu metropolitan city. Nepal is officially the federal democratic republic, a landlocked country in South Asia, bordered to the south, east and west by India and to north by China (fig 2). Kathmandu, the capital of Nepal, lies within the Kathmandu valley along with Bhaktapur district to the east and Lalitpur district to the south and is divided into Kathmandu Metropolitan city and village development committee. Within Kathmandu Metropolitan City there are 35 different wards. Wards are the term used to describe a particular area within the Kathmandu Metropolitan City.

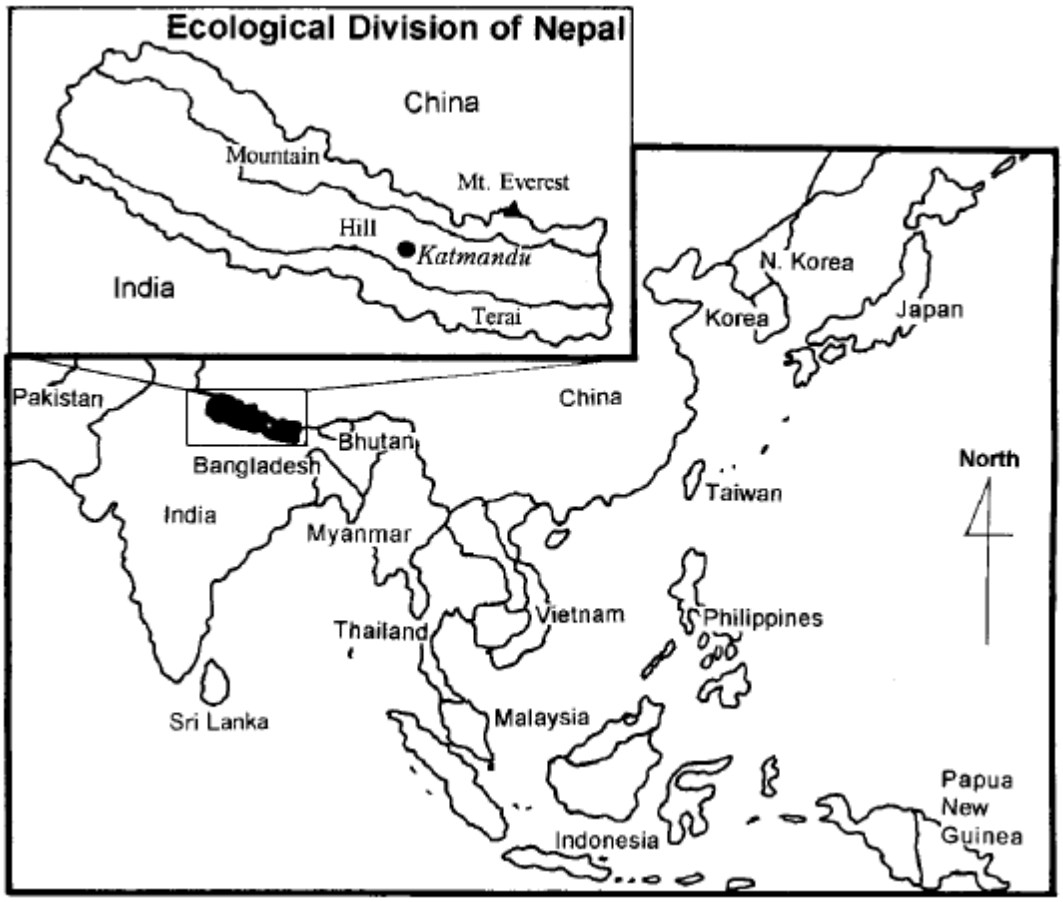

Figure 2: Map showing location of Nepal in South Asia and its capital city Kathmandu (46).

Figure 3: Map showing different wards within the Kathmandu metropolitan city.

2.2 Population of the study

This study was performed in Katmandu metropolitan city. The population of the Kathmandu metropolitan city is divided into different wards and all together there are 35 different wards in Kathmandu metropolitan city. Wards are numbered from 1 to 35 by the government based on the geographical area of administration.

2.3 Sample size

Sample size of 619 was calculated using 'DSS Research: sample size calculator' considering the expected prevalence of back pain in men (67.9%) and in women (74.3%) based on the earlier study in Dharan district (14), at the alpha error level of 5% and beta error level of 20%.

2.4 Sampling scheme

A representative sample from Kathmandu Metropolitan city to which the findings of the study could be generalized was chosen using the 'probability proportional to size' (PPS) cluster technique (47). This technique was used as the wards were not similar in size. In case of cluster sampling method if numbers of clusters are increased this leads to the precision in the estimates so it was decided to select 30 clusters. As the sample size of the study was 650, the individuals to be interviewed per cluster is sample size divided by number of cluster (i.e. $650/30 = 21.66 \approx 22$). Therefore, each cluster consisted of 22 individuals. By PPS sampling technique, if a ward has larger population there is a chance that the larger ward might get selected twice or more. In this study 6 wards got selected twice, whereas 18 wards got selected once only. The detail of this sampling scheme is discussed in Graham Kalton (48).Therefore data were collected from 24 wards out of 35 wards depending upon the population size.

In the selected ward all the main circles (roundabouts) in the center of each ward were numbered and one circle (roundabout) was chosen at random. At the roundabout of the selected ward the interviewer selected a direction randomly by rotating the pen on a flat surface. The first 22 households in that direction were interviewed. Only one member of the household was selected randomly from the list of household members with age of 18 years and above. In case of those wards which got selected twice the roundabout in the center of each ward was randomly selected twice, the roundabout which was selected once was not included while selecting the second roundabout. To make sure that we don't end up collecting the data from the same household in the second round of interview in the same ward, the direction in which the earlier data collection was carried out was not included.

In case the chosen member from the household refused to participate in the study or the house was found locked, another consecutive household from the same ward in the same direction

replaced it (Random walk). For the purpose of the study the members of the household are defined as those who have that household as the primary place of resident, live, sleep and share meal with other members of the household. This type of household survey design is chosen to have an idea about the musculoskeletal problem in the general population of Nepal.

Researcher along with four other data collectors collected data. The data collectors were educated about the questionnaire before conducting research. A pilot project was conducted for four days to make sure that all the data collectors follow the instructions given to them and do it in the same way as much as possible as per the instructions given to them. Second year medical students were recruited as a data collectors, as they have knowledge about research.

2.5 Instruments (Interview tools)

There are different types of instruments to collect data on musculoskeletal symptoms: Western Ontario and McMaster osteoarthritis Index (WOMAC) is a 24 item questionnaire and is developed to collect data on pain, stiffness and physical function from the lower extremities (49). Australian/Canadian Osteoarthritis Hand Index is another tool which includes a 15 items questionnaire to collect data on pain, stiffness and physical function of hand (50). Brief Pain inventory (BPI) which consists of 14 item questionnaire to collect the data on different aspect of pain severity such as worst pain, average pain, present pain and also how pain causes difficulty in daily activities such as mood, sleep, enjoyment and activity of life (51). McGill pain questionnaire is another instrument to collect data on the musculoskeletal symptoms which has 20 different groups of word and patient or subject is asked to select words from the different groups of words which describe their pain best, this instrument helps to analyze quality and intensity of the pain experienced by the individual (52). One of the studies have discussed the shortcomings on data collection when it comes to musculoskeletal pain and

have suggested that it is necessary to design a better questionnaire which would consider all the aspect of musculoskeletal pain (53).

Standardized Nordic questionnaire was used in this study to be the most appropriate instrument to collect data on the musculoskeletal symptoms due to the quite illustrative figure and because it is simple to use for the interviewer and simple to understand for the interviewee (12). All participants were interviewed using a pre-structured questionnaire as an interview guide, mainly based on a standardized Nordic questionnaire to collect information on musculoskeletal symptoms. This questionnaire is a reliable and valid tool to measure musculoskeletal symptoms for epidemiological study which is validated by test-retest reliability (12, 54). A musculoskeletal symptom is defined as pain, ache, and discomfort accompanied by marking on the area of interest. The standardized Nordic questionnaire includes symptoms experienced by the subject in the past 7 days and 12 months in 9 different anatomical body regions. In this research symptoms experienced by the subject in the past 7 days and 12 months were recorded. Symptoms experienced by subject in neck, shoulder, elbow, hand/wrist, upper back, lower back, hip, knee and ankle are included in this study.

COOP/WONCA charts was used in this study to measure the functional ability which consists of six charts which is a reliable and valid tool to measure the functional ability (55). COOP/WONCA chart is one of the tools used in evaluate health-related quality of life (56). Out of six different charts only four were used in this study which measures physical fitness, feelings, daily activities and social activities as the aim of this study was to explore the functional ability of the individual. Subjects were asked to rate their different dimensions of functional ability during the last 14 days on a five point scale. Score 1 on the scale is very

good whereas 5 is very bad. Different levels in the scale were demonstrated by picture, numbers and were also be explained orally by the interviewer.

Other questions on age, gender, occupation, weight, height, smoking status as well as health seeking behavior were included in the questionnaire. Regarding healthcare seeking behavior individuals were asked 'Have you, during the last 12 months, used following strategies to manage your musculoskeletal symptoms?' with options such as '1. Went to doctor' '2. Went to physiotherapist' '3. Went to traditional healer' '4. If went to other or did something else please specify.' The measurement of height and weight were done by using the locally available height measuring tape and weighing machine.

The whole interview guide was translated from English to Nepali and back to English for validity. A medical doctor who was not the part of the research team translated the questionnaire from English to Nepali and another medical doctor translated from Nepali to English.

2.6 Data analysis

Each data collected through questionnaire were coded to maintain anonymity. The collected data were analyzed by using SPSS. The data were summarized by using appropriate statistical method. Statistical significant level was set at $p\text{-value}<0.05$.

Prevalence of musculoskeletal symptoms in adult population was analyzed by frequency analysis. For categorical variables chi-square test was used to compare groups. Individuals who answered 'yes' to symptoms in right, left or both shoulders were categorized as 'yes'. The same categorization was done for elbow and wrists/hands symptoms. Since the median of

the age was at 36 years, we decided to categorize age into two categories; first category 18 to 36 years and second category above 36 years. Different subcategories of the functional ability were all dichotomized into two groups, normal and low functional ability groups. Those individual who reported their different subcategories of functional ability as 1, 2 or 3 on the COOP/WONCA chart were grouped into normal functional ability group and those who reported 4 or 5 were grouped into low functional ability group. Binary logistic regression analysis was done to control for confounding factors on the prevalence of musculoskeletal symptoms. In standardized Nordic questionnaire the individual were asked to report their symptoms that they had in last 12 months and in last 7 days as well as they were also asked if the symptoms had influenced their activities at home or away in the last 12 months where as in COOP/WONCA the functional capacity in the last two weeks were captured. One of the aims of the study was to find the association between symptom and functional capacity despite the fact that there is difference in the reporting time in two different instruments so it decided to compare musculoskeletal symptoms reported in last 7 days with the functional ability to make it more comparable.

3. Ethical consideration:

Ethical clearance was obtained from Regional committee for medical and health research ethics, Norway (REK) and Nepal Health Research Council (NHRC), Nepal before conducting the survey in Nepal. Before conducting the interview the interviewer explained about the research and its purpose to the participant, informed that their participation was not mandatory and got oral consent from the participant. Written consent was avoided as it would give the name of the participants. In oral consent name is not needed and this method increased anonymity. After getting consent interviewer asked the questions regarding musculoskeletal pain and functional ability.

4. Results

4.1 Description of the participants

A total of 660 individuals with age 18 years and above and who were permanent resident of Kathmandu metropolitan city were interviewed. Out of these 660 individuals, males and females had about the same proportional representation (Table 2). The mean age of the participants was 39 years and the mean age of male and female was 40 years and 38 years respectively. The mean body mass index (BMI) of the total sample was 25.3 and the mean BMI of male and female was 24.51 and 26.30 respectively. About (28%) of the individuals were smokers, most of the smokers were men (Table 2).

Table 2: -Background data (missing data not shown) (n=660)

	Total
Gender	
Male(%)	335 (50.8)
Female(%)	325 (49.2)
Age, mean (years), (SD)	39.48 (16)
Male mean (years), (SD)	40.64 (17.707)
Female mean (years), (SD)	38.27, (14.35)
Body mass index mean, (SD)	25.39 (4.8)
Male mean, (SD)	24.51 (4.60)
Female mean, (SD)	26.30 (4.89)
Smoking	
Non-smoker(%)	474 (71.8)
Smoker(%)	186 (28.2)
Out of 660	
Male smoker(%)	155 (23.5)
Female smoker(%)	31 (4.7)

4.2 Prevalence of musculoskeletal symptoms

To estimate the prevalence people were asked 'Have you at any time during the last 12 months had trouble (ache, pain, discomfort) in neck, shoulders, elbows, wrists/hands, upper back, low back, one or both hips/thighs, one or both knees and one or both ankles/feet' and 'Have you had trouble at any time during the last 7 days?' in the same nine different body

parts. To explore if people had trouble with daily activities because of symptoms, they were asked 'Have you at any time during the last 12 months been prevented from doing normal work (at home or away from home) because of the trouble?'. Out of the total sample, 460 (69.7%) individuals reported musculoskeletal symptoms from one or more parts of the body during the previous 12 months. According to body part the most commonly reported regions with musculoskeletal symptom were low back (37.7%), knee (27.0%), ankle (14.8%) and wrist and hand (9.1%) during the previous 12 months. Respondents complained less musculoskeletal symptom in shoulder (7.7%), hip and thigh (7.4%), elbow (6.7%), upper back (5.6%) and neck (4.4%) during the previous 12 months (Table 3).

Similarly, the most commonly reported regions with musculoskeletal symptoms in the last 7 days were low back (26.8%), knee (19.4%) and ankle (10.0%) in the last 7 days (Table 3). Respondents complained less musculoskeletal symptoms in wrist/hands (5.6%), hip/thighs (5.6%), shoulder (4.7%), upper back (4.5%), elbow (4.4%) and neck (3.5%) in the last 7 days (Table 3).

The prevalence of musculoskeletal symptoms were significantly higher in female than in male in wrist/hands, low back and knees (Table 3) during the previous 12 months. The prevalence of musculoskeletal symptoms were significantly higher in female than in male in elbow, low back, knees and ankle and feet during the last 7 days (Table 3). Similarly, musculoskeletal symptoms in low back and knees prevented significantly more female than male from doing the normal activities at home and outside during the last 12 months (Table 3).

Table 3 Prevalence of musculoskeletal symptoms among male and female

	Neck		Shoulder		Elbow		Wrists/ Hands		Upper Back		Low Back		Hips/ Thighs		Knees		Ankles/ Feet	
Symptoms last 12 months																		
Male n(%)(n=335)	16	(4.8)	22	(6.6)	16	(4.8)	22*	(6.6)	15	(4.5)	96**	(28.7)	21	(6.3)	70**	(20.9)	41	(12.2)
Female n(%)(n=325)	13	(4.0)	29	(8.9)	28	(8.6)	38*	(11.7)	22	(6.8)	153**	(47.1)	28	(8.6)	108**	(33.2)	57	(17.5)
Total n(%) (n=660)	29	(4.4)	51	(7.7)	44	(6.7)	60	(9.1)	37	(5.6)	249	(37.7)	49	(7.4)	178	(27.0)	98	(14.8)
Symptoms prevented from doing normal work last 12 months																		
Male n(%)(n=335)	7	(2.1)	13	(3.9)	8	(2.4)	13	(3.9)	7	(2.1)	46*	(13.7)	16	(4.8)	30*	(9.0)	18	(5.4)
Female n(%)(n=325)	2	(0.6)	14	(4.3)	16	(4.9)	15	(4.6)	13	(4.0)	78*	(24.0)	17	(5.2)	55*	(16.9)	24	(7.4)
Total n(%) (n=660)	9	(1.4)	27	(4.1)	24	(3.6)	28	(4.2)	20	(3.0)	124	(18.8)	33	(5.0)	85	(12.9)	42	(6.4)
Symptoms last 7 days																		
Male n(%) (n=335)	12	(3.6)	13	(5.5)	9*	(2.7)	15	(4.5)	13	(3.9)	63**	(18.8)	15	(4.5)	45**	(13.4)	25*	(7.5)
Female n(%) (n=325)	11	(3.4)	18	(3.9)	20*	(6.2)	22	(6.8)	17	(5.2)	114**	(35.1)	22	(6.8)	83**	(25.5)	41*	(12.6)
Total n(%) (n=660)	23	(3.5)	31	(4.7)	29	(4.4)	37	(5.6)	30	(4.5)	177	(26.8)	37	(5.6)	128	(19.4)	66	(10)

* Statistically significant $p < 0.05$ ** statistically significant $p < 0.01$

Table 4 Musculoskeletal symptoms from nine different body parts in different age groups

	Neck	Shoulder	Elbow	Wrist/hands	Upper back	Low back	Hip/thighs	Knee	Ankle/feet
Symptoms last 12 months									
Age categories									
(18-36) n(%) (n=333)	11(3.3)	19(5.7)	14(4.2)	24(7.2)	14(4.2)	122(36.6)	17(5.1)	52(15.6)	32(9.6)
(36 above) n(%) (n=324)	18(5.6)	32(9.9)*	30(9.3)*	36(11.1)	23(7.1)	127(39.2)	32(9.9)*	126(38.9)**	66(20.4)**
Total n(%) (n=660)	29(4.4)	51(7.8)	44(6.7)	60(9.1)	37(5.6)	249(37.9)	49(7.5)	178(27.1)	98(14.9)
	p=0.160	p=0.046	p=0.010	p=0.082	P=0.108	p=0.499	p=0.020	p≤0.000	p≤0.000
Symptoms that prevented from normal activities at home or away									
Age categories									
(18-36) n(%) (n=333)	1(0.3)	11(3.3)	9(2.7)	9(2.7)	5(1.5)	55(16.5)	11(3.3)	21(6.3)	11(3.3)
(36 above) n(%) (n=324)	8(2.5)*	16(4.9)	15(4.6)	19(5.9)*	15(4.6)*	69(21.3)	22(6.8)*	64(19.8)**	31(9.6)**
Total n(%) (n=660)	9(1.4)	27(4.1)	24(3.7)	28(4.3)	20(3.0)	124(18.9)	33(5.0)	85(12.9)	42(6.4)
	p=0.017	p=0.291	p=0.188	p=0.045	p=0.020	p=0.118	p=0.041	p≤0.000	p=0.001
Symptoms in last 7 days									
Age categories									
(18-36) n(%) (n=333)	9(2.7)	11(3.3)	8(2.4)	13(3.9)	11(3.3)	83(24.9)	12(3.6)	32(9.6)	17(5.1)
(36 above) n(%) (n=324)	14(4.3)	20(6.2)	21(6.5)*	24(7.4)	19(5.9)	94(29.0)	25(7.7)*	96(29.6)**	49(15.1)**
Total (n=660)	23(3.5)	31(4.7)	29(4.4)	37(5.6)	30(4.6)	177(26.9)	37(5.6)	128(19.5)	66(10.0)
	p=0.256	p=0.083	p=0.011	p=0.051	p=0.116	p=0.238	p=0.022	p≤0.000	p≤0.000

*Statistically significant p<0.05 **Statistically significant p<0.01

The prevalence of musculoskeletal symptoms were higher in all different parts of the body in those who were aged above 36 years than those who were aged 18-36 years in last 12 months and 7 days (table 4). Prevalence of shoulder, elbow, hip/thighs, knee and ankle/feet symptoms the last 12 months were significantly higher in those aged above 36 years than those who were aged between 18-36 years (table 4).

Significantly more of those aged above 36 years than those aged between 18-36 years reported that neck, wrist/hands, upper back, hip/thighs, knee and ankle symptoms prevented them from doing normal activity at home or away in the last 12 months (table 4).

The prevalence of elbow, hip/thighs, knee and ankle/feet symptoms in last 7 days were significantly higher in those aged above 36 years than those who were aged between 18-36 years (table 4).

4.3 Health care seeking

To explore the health care seeking behavior people were asked 'Have you, during the last 12 months, used following strategies to manage you musculoskeletal symptoms?' with options such as '1. Went to doctor' '2. Went to physiotherapist' '3. Went to traditional healer' '4. If went to other or did something else please specify'. Out of 460 people who reported to have musculoskeletal symptoms somewhere in their body 272(59.1%) did not seek any care from medical healthcare giver whereas 154(33.5%) went to doctor, 17(3.7%) went to doctor and physiotherapist, 5(1.1%) went to physiotherapist, 5(1.1%) went for ayurvedic (homeopathic treatment where the patient is given medicine made from medical herbs) treatment, 3(0.7%) went to traditional healer and 3(0.7%) went to doctor and traditional healer (Table 5). Those who went to doctor and physiotherapist went to doctor first and once they were referred to physiotherapist by the doctor then only they went to physiotherapist. Those individual who

went to doctor and traditional healer, went to traditional healer first and then to doctor because their health condition didn't improve by the former treatment.

Table 5 Healthcare Seeking behavior among people who had pain somewhere

Health seeking behaviour	**Pain somewhere (n=460)**	
	Frequency	**Per cent**
Did not seek help	272	59.1
Doctor	154	33.5
Doctor and physiotherapist	17	3.7
Physiotherapist	5	1.1
Ayurvedic	5	1.1
Traditional Healer	3	0.7
Doctor and traditional healer	3	0.7

4.4 Functional ability

To explore the functional ability people were asked to rate their physical fitness, daily activities, feelings and social activities in last 2 weeks (Annex). Prevalence of shoulder, elbow, wrist/hand, upper back, lower back, hip, knee and ankle/foot symptoms were significantly higher in persons with low physical fitness than the persons with normal physical fitness (Table 6).

Prevalence of shoulder, elbow, wrist/hand, upper back, lower back, hip and knee symptoms were significantly higher in persons with low score on feelings than the persons with normal feelings (Table 6).

Prevalence of shoulder, elbow, wrist/hand, upper back, lower back, hip, knee and ankle/foot symptoms were significantly higher in persons with low daily activity than the persons with normal daily activities (Table 6).

Prevalence of shoulder, elbow, wrist/hand, upper back, lower back, hip, knee and ankle/foot symptoms were significantly higher in persons with low social activity than the persons with normal social activities (Table 6).

Neck symptom in last 7 days had no significant effect on any sub-categories of the functional ability (Table 6).

Table 6 Musculoskeletal symptoms (in last 7 days) and functional ability

	Functional ability							
Area of	Physical fitness		Feelings		Daily activity		Social activity	
symptom in last 7 days	Normal **(n=550)**	Low **(n=109)**	Normal **(n=606)**	Low **(n=54)**	Normal **(n=604)**	Low **(n=56)**	Normal **(n=621)**	Low **(n=38)**
Neck								
Yes n(%)	18 (3.3)	5 (4.6)	21(3.5)	2(3.7)	21(3.5)	2(3.6)	22(3.5)	1(2.7)
Shoulder								
Yes n(%)	19(3.5)** (p=0.001)	12(11.0)**	20(3.3)** (p≤0.000)	11(20.4)**	21(3.5)** (p≤0.000)	10(17.9)**	24(3.9)** (p≤0.000)	7(18.4)**
Elbow								
Yes n(%)	17(3.1)** (p≤0.000)	12(11.0)**	22(3.6)** (p=0.001)	7(13.0)**	18(3.0)** (p≤0.000)	11(19.6)**	22(3.5)** (P≤0.000)	7(18.4)**
Wrists/hands								
Yes n(%)	22(4.0)** (p≤0.000)	14(12.8)**	28(4.6)** (p≤0.000)	9(16.7)**	27(4.5)** (p≤0.000)	10(17.9)**	29(4.7)** (p≤0.000)	8(21.1)**
Upper back								
Yes n(%)	20(3.6)* (p=0.011)	10(9.2)*	21(3.5)** (p≤0.000)	9(16.7)**	19(3.1)** (p≤0.000)	11(19.6)**	22(3.5)** (p≤0.000)	8(21.1)**
Lower back								
Yes n(%)	135(24.5)** (p=0.003)	42(38.5)**	156(25.7)* (P=0.037)	21(38.9)*	143(23.7)** (p≤0.000)	34(60.7)**	161(25.9)* (p=0.029)	16(42.1)*
Hips/thighs								
Yes n(%)	22(4.0)** (p≤0.000)	15(13.8)**	30(5.0)* (P=0.014)	7(13.0)*	24(4.0)** (p≤0.000)	13(23.2)**	30(4.8)** (p≤0.000)	7(18.4)**
Knees								
Yes n(%)	73(13.3)** (p≤0.000)	55(50.5)**	111(18.3)* (P=0.019)	17(31.5)*	101(16.7)** (p≤0.000)	27(48.2)**	109(17.6)** (p≤0.000)	19(50.0)**
Ankles/foot								
Yes n(%)	39(7.1)** (p≤0.000)	26(23.9)**	57(9.4)	9(16.7)	52(8.6)** (p≤0.000)	14(25.0)**	55(8.9)** (p≤0.000)	11(28.9)**

*Statistically significant p <0.05 ** statistically significant p<0.01

4.5 Results from regression analysis of musculoskeletal symptoms

Factors like age, sex, BMI and smoking might be correlated to musculoskeletal symptoms due to this, a regression analysis was performed.

After adjusting for sex, age, BMI and smoking, the prevalence of elbow, low back and knees symptoms were still significantly higher in female than male in the last 12 months (Table 7). Similarly, after adjusting for gender, BMI and smoking the prevalence of neck, shoulder, elbow, hip/thighs, knees and ankle/feet symptoms in the last 12 months were significantly higher in those aged above 36 years than those between 18-36 years (Table 7).

After adjusting for the age, sex, BMI and smoking low back and knee symptoms were reported to prevent more female than male in the last 12 months from doing normal activity at home or away significantly (Table 7). Similarly after adjusting for gender, BMI and smoking wrist/hands, upper back, knees and ankle/feet symptoms prevented significantly more participants aged above 36 years than those aged 18-36 years from doing normal activities at home or away in the last 12 months (Table 7).

After adjusting for age, BMI and smoking the prevalence of elbow (OR=2.781; 95% CI=1.128-6.858), low back (OR=2.617; 95% CI=1.744-3.926) and knee (OR=1.997; 95% CI=1.270-3.140) symptoms were significantly higher in female than male in the last 7 days. Similarly, after adjusting for gender, BMI and smoking the prevalence of shoulder (OR=0.269; 95% CI=0.204-0.994), elbow (OR=0.269; 95% CI=0.111-0.649), wrist/hands (OR=0.446; 95% CI=0.215-0.924), hip/thighs (OR=0.436; 95% CI=0.208-0.913), knees (OR=0.250; 95% CI=0.157-0.396) and ankle/feet (OR=0.327; 95% CI=0.180-0.594) symptoms in the last 7 days were significantly higher in those aged above 36 years than those between 18-36 years.

Table 7: - Regression analysis on musculoskeletal symptom in last 12 months and gender (controlling for sex, age, BMI and smoking)

Symptoms in last 12 months	Adjusted p-value	Odds ratio	95 % Confidence interval	
			Lower	Upper
Neck				
Sex	0.850	0.924	0.407	2.099
Age category	0.071*	0.475	0.212	1.065
BMI	0.127	0.929	0.844	1.021
Smoking	0.654	1.228	0.499	3.023
Shoulder				
Sex	0.301	1.4	0.740	2.647
Age category	0.036*	0.515	0.277	0.957
BMI	0.685	0.987	0.925	1.053
Smoking	0.582	1.227	0.592	2.544
Elbow				
Sex	0.031*	2.192	1.074	4.476
Age category	0.004*	0.365	0.182	0.732
BMI	0.175	0.950	0.882	1.023
Smoking	0.578	1.263	0.554	2.877
Wrist/hand				
Sex	0.060	1.777	0.975	3.24
Age category	0.023*	0.514	0.289	0.913
BMI	0.197	0.959	0.9	1.022
Smoking	0.122	1.813	0.853	3.853
Upper back				
Sex	0.149	1.741	0.819	3.7
Age category	0.088	0.534	0.260	1.097
BMI	0.606	0.980	0.909	1.057
Smoking	0.822	0.910	0.399	2.072
Lower back				
Sex	0.000**	2.437	1.693	3.507
Age category	0.466	0.881	0.628	1.237
BMI	0.773	1.005	0.970	1.041
Smoking	0.385	0.837	0.560	1.250
Hips/thighs				
Sex	0.203	1.532	0.794	2.956
Age category	0.032*	0.497	0.262	0.941
BMI	0.803	1.008	0.947	1.073
Smoking	0.716	0.876	0.430	1.785
Knee				
Sex	0.008**	1.716	1.149	2.562
Age category	0.000**	0.3	0.202	0.444
BMI	0.019	1.047	1.008	1.088
Smoking	0.088	1.494	0.942	2.371
Ankle				
Sex	0.173	1.398	0.863	2.264
Age category	0.001**	0.431	0.268	0.692
BMI	0.177	1.031	0.986	1.079
Smoking	0.299	1.343	0.770	2.344

4.6 Regression analysis of MSS and functional ability

After adjusting for gender, age, BMI and smoking the prevalence of shoulder, elbow, wrist/hand, low back, hip/thighs, knee and ankle/feet symptoms were significantly higher in persons with low physical fitness than the persons with normal physical fitness (Table 8).

Similarly, adjusting for the same factors, the prevalence of shoulder, elbow, wrist/hand, upper back and hip\thighs symptoms were significantly higher in persons with low feelings than the persons with normal feelings (Table 8).

Further, the regression analysis shows that the prevalence of shoulder, elbow, wrist/hands, upper back, lower back, hip\thighs, knee and ankle/feet symptoms were significantly higher in persons with low daily activity than the persons with normal daily activities (Table 8).

Lastly, the regression analysis shows that the prevalence of shoulder, elbow, wrist/hand, upper back, lower back, hip\thighs, knees and ankle/foot symptoms were significantly higher in persons with low social activity than the persons with normal social activities (Table 8).

Table 8: - Regression analysis on functional ability and musculoskeletal symptoms (in last 7 days) controlling for gender, age, BMI and smoking.

Functional ability	Adjusted p-value	Odds ratio	95% confidence interval	
			Lower	Upper
Physical fitness				
Neck symptoms(7 days)	0.751	1.193	0.401	3.552
Gender	0.019*	1.790	1.099	2.915
Age category	0.000**	0.083	0.044	0.159
Shoulder symptoms(7 days)	0.014*	0.343	0.146	0.806
Gender	0.022*	1.779	1.088	2.908
Age category	0.000**	0.085	0.045	0.161
Elbow symptoms(7 days)	0.020*	0.355	0.148	0.852
Gender	0.033*	1.706	1.043	2.792
Age category	0.000**	0.087	0.046	0.166
Wrist/hands symptoms(7 days)	0.007*	0.335	0.151	0.740
Gender	0.018*	1.809	1.106	2.960
Age category	0.000**	0.084	0.044	0.161
Upper back symptoms(7 days)	0.089	0.463	0.191	1.123
Gender	0.024*	1.753	1.075	2.860
Age category	0.000**	0.085	0.044	0.161
Low back symptoms(7 days)	0.028*	0.585	0.362	0.944
Gender	0.047*	1.652	1.006	2.714
Age category	0.000**	0.083	0.043	0.158
Hip/thighs symptoms(7 days)	0.004**	0.323	0.149	0.697
Gender	0.023*	1.770	1.081	2.897
Age category	0.000**	0.085	0.044	0.162
Knees symptoms(7 days)	0.000*	0.242	0.148	0.395
Gender	0.126	1.490	0.894	2.483
Age category	0.000**	0.106	0.055	0.205
Ankle/feet symptoms(7 days)	0.002**	0.381	0.209	0.694
Gender	0.032*	1.714	1.046	2.809
Age category	0.000**	0.089	0.047	0.170

Feelings				
Neck symptoms(7 days)	0.982	1.017	0.230	4.502
Gender	0.136	1.615	0.860	3.032
Age category	0.095	0.601	0.331	1.093
BMI	0.547	0.981	0.920	1.045
Smoking	0.754	0.896	0.451	1.781
Shoulder symptoms(7 days)	0.000**	0.144	0.064	0.324
Gender	0.175	1.570	0.818	3.011
Age category	0.208	0.678	0.370	1.241
Elbow symptoms(7 days)	0.008**	0.285	0.112	0.725
Gender	0.221	1.489	0.787	2.817
Age category	0.189	0.667	0.365	1.221
Wrist/hands symptoms(7 days)	0.002**	0.264	0.116	0.602
Gender	0.162	1.578	0.833	2.987
Age category	0.166	0.652	0.356	1.194
Upper back symptoms(7 days)	0.000**	0.198	0.085	0.464
Gender	0.202	1.513	0.801	2.860
Age category	0.174	0.659	0.361	1.203
Low back symptoms(7 days)	0.091	0.601	0.333	1.085
Gender	0.250	1.460	0.766	2.782
Age category	0.113	0.617	0.340	1.121
Hip/thighs symptoms(7 days)	0.040*	0.395	0.163	0.956
Gender	0.168	1.561	0.829	2.941
Age category	0.139	0.636	0.349	1.159
Knees symptoms(7 days)	0.078	0.556	0.289	1.069
Gender	0.211	1.500	0.794	2.832
Age category	0.238	0.689	0.371	1.280
Ankle/feet symptoms(7 days)	0.204	0.599	0.272	1.321
Gender	0.166	1.562	0.830	2.939
Age category	0.145	0.638	0.348	1.168
Daily activity				
Neck symptoms(7 days)	0.951	1.048	0.232	4.728
Gender	0.003**	2.661	1.383	5.122
Age category	0.004**	0.401	0.215	0.748
Shoulder symptoms(7 days)	0.000**	0.182	0.078	0.425
Gender	0.005**	2.626	1.344	5.132

Age category	0.009	0.431	0.230	0.807
Elbow symptoms(7 days)	0.000**	0.145	0.061	0.343
Gender	0.012*	2.361	1.210	4.607
Age category	0.019*	0.469	0.249	0.883
Wrist/hands symptoms(7 days)	0.001**	0.243	0.107	0.548
Gender	0.004**	2.639	1.358	5.127
Age category	0.009**	0.433	0.231	0.815
Upper back symptoms(7 days)	0.000**	0.146	0.063	0.338
Gender	0.007**	2.487	1.278	4.836
Age category	0.011*	0.440	0.235	0.827
Low back symptoms(7 days)	0.000**	0.234	0.131	0.419
Gender	0.037*	2.063	1.045	4.074
Age category	0.005**	0.408	0.217	0.766
Hip/thighs symptoms(7 days)	0.000**	0.161	0.075	0.346
Gender	0.006**	2.549	1.303	4.985
Age category	0.011*	0.439	0.233	0.829
Knees symptoms(7 days)	0.000**	0.289	0.157	0.532
Gender	0.016*	2.267	1.166	4.408
Age category	0.075	0.552	0.288	1.061
Ankle/feet symptoms(7 days)	0.009**	0.393	0.195	0.791
Gender	0.007**	2.491	1.289	4.814
Age category	0.013*	0.450	0.239	0.847
Social activity				
Neck symptoms(7 days)	0.685	1.526	0.198	11.787
Gender	0.654	0.844	0.403	1.770
Age category	0.005*	0.334	0.154	0.723
Shoulder symptoms(7 days)	0.001**	0.195	0.076	0.501
Gender	0.638	0.836	0.396	1.763
Age category	0.009**	0.359	0.167	0.774
Elbow symptoms(7 days)	0.000**	0.168	0.063	0.447
Gender	0.459	0.753	0.356	1.595
Age category	0.014*	0.378	0.174	0.820
Wrist/hands symptoms(7 days)	0.000**	0.202	0.083	0.492
Gender	0.667	0.850	0.404	1.785

Age category	0.010*	0.359	0.165	0.782
Upper back symptoms(7 days)	0.000**	0.147	0.059	0.368
Gender	0.519	0.783	0.373	1.646
Age category	0.009**	0.357	0.165	0.772
Low back symptoms(7 days)	0.039*	0.483	0.242	0.962
Gender	0.485	0.766	0.363	1.618
Age category	0.006**	0.338	0.157	0.728
Hip/thighs symptoms(7 days)	0.004**	0.260	0.104	0.651
Gender	0.632	0.835	0.400	1.744
Age category	0.009**	0.357	0.165	0.773
Knees symptoms(7 days)	0.000**	0.231	0.112	0.478
Gender	0.355	0.703	0.333	1.483
Age category	0.053	0.455	0.205	1.010
Ankle/feet symptoms(7 days)	0.002**	0.283	0.129	0.620
Gender	0.545	0.796	0.380	1.667
Age category	0.016**	0.381	0.174	0.832

4.7 Experiences during data collection

During data collection all data collectors along with principle investigator had gone through good as well as bad experiences for instance some people were very welcoming and open to share their health problems whereas some were not at all interested. Some of the common experiences that everyone had during data collection was that those who were not interested at all, when we approached them for data collection they didn't allow us to enter in their compound and told us to leave immediately in a very rude manner. Some of them were not at all interested because they felt like we were from some NGO and we were there just to exhaust the budget even after explaining that this study was a part of master's program. Another bad experience that each one of us had was with dogs which were left loose and we all were chased by them. Another problem was with houses which were found locked even

after visiting for the second time in that case that house was not included in the house and was entered as house found locked.

5. Discussion

5.1 The prevalence of musculoskeletal symptoms in an adult population in Kathmandu Metropolitan City

The findings of the study suggest that symptoms from low back and knees are reported to be common in the general population which is in line with the finding from studies that were conducted in the Asian countries (3, 19-22). One of the studies from urban Vietnam reported that the most common musculoskeletal complain in urban Vietnam were Knee pain (18.2%) and low back pain (11.2%) in the last 7 days (3) and in the present study it was found that the two most common musculoskeletal symptoms in the last 7 days were low back (26.8%) and knee (19.4%). In the present study and in the study from Vietnam the most common musculoskeletal complain are same but the prevalence of back symptom is more common in present study from KMC. The prevalence of the low back symptoms was higher in the present study when compared with the study from Vietnam but the prevalence of knee symptoms is almost same. One of the studies from Iran reported that the four most common musculoskeletal complain in the last 7 days were knee (25.5%), dorso-lumbar (22.9%), shoulder (15.3%) and cervical pain (14.1%) (20) where as in the present study the four most common musculoskeletal symptoms in the last 7 days were low back (26.8%), knee (19.4%), ankle (10%), wrist/hands (5.6%) and hip/thighs (5.6%). One of the studies from India reported in the last 7 days prior to the study the prevalence of knees pain (13.2%), lumbar pain (11.4%), shoulder pain (7.4%), calf pain (6.6%), ankle pain (6.5%), elbow pain (6.5%), wrist pain (6.4%), hand pain (6.1%) and neck pain (6%) (21) where as in the present study it was found that low back symptom (26.8%) was the most common symptom in the last 7 days

followed by symptoms in knee (19.4%), ankles/feet (10%), wrist/hands (5.6%), hip/thighs (5.6%), shoulder (4.7%), upper back (4.5%), elbow (4.4%) and neck (3.5%). In one of the study in Thailand it was found that the four most common musculoskeletal complains in the last 7 days were back pain (22.7%), knee pain (12.5%), hip (6.5%) and neck (5%) (22) where as in the present study the four most common symptoms in the last 7 days are low back (26.8%), knee (19.4%), ankles/feet (10%), wrist/hands (5.6%) and hips/thighs (5.6%).

In most European countries the prevalence of back, neck and upper limb pain is reported to be high than in present study from Nepal (18, 57). In the Dutch general population, the three most commonly self-reported musculoskeletal pain were low back (26.9%), shoulder pain (20.9%) and neck pain (20.6%) (18). In the present study from KMC low back (37.7%), knee (27%) and ankle (14.8%) were the three commonly self-reported symptoms in the last 12 months. More complains from low back was reported in KMC than in Dutch population. More complains from shoulder and necks were reported in Dutch population than in the present study. More symptoms were reported from knee and ankle in the present Nepalese study than in the Dutch population. The reason for these differences are unknown, but one might speculate the less problems with neck and upper limbs may be related to that people in Nepal spend less time on computers than persons in the Netherlands because those who use computers are likely to develop musculoskeletal symptoms in neck, low back wrist/arm and shoulder (58). The reason for people reporting of more knee symptoms in the present Nepalese study can be because knee osteoarthritis is very common in developing countries (59) and Nepal is a developing country in South Asia. Along with the other risk factors; the very strenuous physical labor among many persons, which includes heavy weight lifting, kneeling and squatting were reported as a major risk factor of knee osteoarthritis in developing countries (60). In a study conducted in 34 European countries it was found that the overall prevalence of back pain was 46.1% (95% CI 45.5-46.6) and neck/upper limb was

44.6% (95% CI 44.1-45.1) with a lot of variation in the prevalence of back pain and neck/upper limb pain; in Portugal prevalence of back pain was (63.8%) and in Ireland the prevalence of back pain was (25.7%) and range of prevalence of neck /upper limb pain was 26.5% in Ireland to 67.7% in Finland (57). This again indicates that prevalence of neck/upper limb pain is higher in western counties than in KMC but the prevalence of back pain in some of the western countries were quite higher (Portugal 63.8%) as well as less (Ireland 25.7%) than in KMC 37.7%.

5.2 To identify the association between gender and musculoskeletal symptoms

Finding of this study show that prevalence of musculoskeletal symptoms were higher in female than in male which is similar to the finding from the Asian countries as well as from European countries (18, 21, 57). In KMC this might be explained by that female do all the household work since morning till the late night i.e. they are constantly working for more than 8 hours throughout the day. Especially when a woman is married and working as well then she is responsible to cook food, do the dishes, wash clothes, clean house and work as well due to which she has to do a lot of activities at home and at work which increases their risk of developing musculoskeletal symptoms so this may be the reason why the prevalence of musculoskeletal symptoms were higher in female in KMC. It has been suggested that women tend to report a higher occurrence of symptoms than men, both when using this instrument and similar questionnaires. This has been shown both in studies of general populations and in studies of working population (61, 62). The observed gender differences could be a reflection of a general excess of psychosomatic symptoms among women, but could also be related to differences in working conditions and social roles between the genders (63, 64).

5.3 To identify the association between age and musculoskeletal symptoms

Finding of the present Nepalese study shows that the prevalence of musculoskeletal symptoms, especially from lower limb were higher in old age group which is similar to the finding from the other studies (39, 65). One of the studies from Sweden reported that there was increase in musculoskeletal symptoms (pain in the joints, pain in the legs and backache) with the increase in age with slight decline between 60 to 67 age in the last three months (39) and in present study the prevalence of the musculoskeletal symptoms were higher in all different parts of the body in those who were aged above 36 years than in those who were aged 18-36 years in last 12 months. One of the studies from United Kingdom reported that older people experienced more musculoskeletal pain than younger people but the overall prevalence of the pain didn't increase substantially beyond 55-64 age group and the prevalence of musculoskeletal pain increased in hip/thigh, knee and ankle/foot with the increase in age in the past month (65) similarly in present study it was found that prevalence of prevalence of hip/thighs, knee and ankle symptoms along with shoulder and elbow symptoms were significantly high in those who were aged above 36 years than those aged between 18-36 years in last 12 months. Prevalence of different musculoskeletal disease increases with increase in age for instance osteoarthritis (66) this can be one of the reason there was high prevalence of musculoskeletal symptoms in the older age group.

5.4 To identify the association between functional ability and musculoskeletal symptoms

In this study it was found that those who had musculoskeletal symptoms had problems with functional ability which is similar to the finding from other studies (28, 29). In a study from Norway it was reported that there was strong relationship between number of musculoskeletal symptoms and functional ability regardless of the fact that what type of musculoskeletal symptoms was reported (28) similarly in present study it was found that those who

complained of shoulder, elbow, wrists/hands, upper back, lower back, hips/thighs, knees and ankles/foot had significantly low functional ability. In study from US reported that those who had joint or limb pain and back pain had decrease in functional status (29) which is similar to the finding in the present study.

5.5 To explore the health care seeking behavior in case of musculoskeletal symptoms

The finding of this study that majority of the people go to physician at hospital to seek advice and treatment for musculoskeletal symptom which is in line with the finding from study conducted in Kuwait (19). The finding of the study suggest that a larger portion of people with musculoskeletal symptom didn't seek any medical help 'why?' is a matter of discussion, is it because of poverty or because they consider pain as part of their routine life or because of low awareness level about where to go and what to do when they happen to have musculoskeletal symptom or is it because they didn't perceived the symptoms that they were have was life threatening to them. On the basis of field work and also since those who agreed to participate were very open to share their experience, they reported that it is because of poverty that they couldn't afford to go to physician as people have to pay out of their pocket for any kind of medical consultation and another interesting fact that people have shared is that they would continue their work neglecting any kind of musculoskeletal symptom as long as they become unable to carry out their normal activity or as long as they wouldn't consider themselves as ill. Another question that has come up after data collection is 'Is it only in the context of musculoskeletal symptom that majority of the people don't seek medical help or it's just the same for other illness as well and at what level of their perceived illness individual in Nepal would seek help?'. Probably another study on health seeking behavior would be able to answer these questions.

From the present study it seems like musculoskeletal symptoms are one of the general public problems, as most of the people with musculoskeletal symptoms had low functional ability which might lead to disability later in their life, and this should be addressed by policy makers and health care systems in Nepal to find the cause and explore things further.

5.6 Methodological issues

This was a descriptive cross sectional study so the cause of the musculoskeletal symptoms cannot be determined, and this was not the aim of the present study. This type of design was useful for the present objectives as the study was cheap and quick method to estimate the prevalence of musculoskeletal symptoms. Strength of this study was that the primary data were collected in a short time period with the same method. All the data collectors were trained through a pilot project conducted for four days wherein they had opportunity to collect data themselves as well as see how data was collected by principle investigator and other data collectors. This pilot project also helped data collectors to collect data in the similar manner which helped in standardizing the data collection process. But sill there is possibility that there can be difference in the way the data were collected by five different persons. Another advantage was that all data collectors were from Nepal and they all knew the Nepali languages as well as they all were second year medical student which gave added strength to the study. In this study information on musculoskeletal symptoms were collected by using standardized Nordic questionnaire which is a reliable and valid tool. Other information such as functional capacity of the individual was collected through COOP/WONCA chart which also is a reliable and valid tool. Both the questionnaire and the chars had figures to be shown to the person who was interviewed. This seemed to help in data collection to obtain the data as it was easy to comprehend for the participants who were interviewed.

Even though the standardized tools were used to collect information the interviewed people are likely to recall very disabling pain experiences more than less serious (recall bias) (67). More over the data collected in this study was self-reported and the individual reporting the symptoms were also unaware of the fact that the symptoms that they reported were truly of the musculoskeletal origin or not.

Considering the limitation mentioned above the data reported in this study should be interpreted with caution. The situation and environment during the time of questioning and how people have reported their symptoms for instance some might have reported any type of pain/ache or discomfort they have had experienced in the last 7 days and in last 12 months where as some might not have had reported minor pain/ache or discomfort at all might also have had affected the result.

Even though the sample size was efficient and sufficient according to the sample size calculation but it could have been larger to make analysis of subgroups for instance functional ability and age groups which is not possible now. To avoid sample selection bias probability proportionate to size sampling was used while selecting wards. The data were drawn from Kathmandu which is a urban site, inferences on the basis of the data drawn to the whole population is to be made with precaution as the work nature and life style differ from rural site because it was reported in one of the study in India that there is difference between the prevalence of musculoskeletal complains between the urban and rural population since Kathmandu is a urban city in Nepal the results of this study should be generalized with caution (68).

There were quite a lot of household who refused to participate as one person from the household was to be selected for the interview it was not possible to report how different or similar were the population who refused to participate from those who agreed to participate. There were few numbers of houses which were found locked even after visiting those houses

for the second time so in this case also it was not possible to report the difference or similarity between the participant and those who were not found at home. Due to the unknown characteristics of those people whose house were found locked and those who refused to participate so it is difficult to conclude if the prevalence was over or under-representative in the study sample.

5.7 Generalization and further studies

KMC is one of the largest city in Nepal so the result of this study can be generalized to the whole Nepalese population but the daily activities of the people living in rural area of Nepal are quite different than that of urban city like KMC so generalization of the result of this study to the whole population in Nepal should be done with cautions. Further studies are required to identify what are the risk factors that are causing musculoskeletal symptoms in the general population so that it would be easy to create awareness about how to prevent musculoskeletal symptoms and also to tailor the treatment depending on the risk factors and why people with pain choose to live with it without seeking for medical help.

The result of this study can be valid for other urban cities in other South Asian countries because the lifestyle of people in these countries are almost similar but there can be difference in cultural and belief as well as the level of education that people have so the generalization should be done with cautions.

6. Conclusion

This study adds to the knowledge about musculoskeletal symptoms in the general population in KMC. Prevalence of symptoms from low back and knees are most common in general population of KMC. Musculoskeletal symptoms are more common among females than males and more common among those aged above 36 years and among those reporting low functional ability. The healthcare involved in the treatment of persons with MSS should be

explored further in the Nepal population, to find the causes of these problems and proper methods for prevention.

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8. Annex

Serial No:-……..

Interview

The date of inquiry ……../……../……..

Years/months/days

Ward Number

……

Gender (tick off)

1. Female
2. Male

How old are you?

……..

What is your occupation?

…….

How long have you been doing your present job?

…….years ……months

Weight in kg.

…….

Height in centimeters

…….

(Smoking is very common now a day.)

Do you smoke?

1. Yes
2. No

Q.no 1) Physical Fitness

Please point in the picture. During the past 2 weeks…

What was the hardest physical activity that you could do for at least 2minutes?

Very heavy, (for example) run, at a fast pace	**1** 
Heavy, (for example) jog, at a slow pace	**2** 
Moderate, (for example) walk, at a fast pace	**3** 
Light, (for example) walk, at a medium pace	**4** 
Very light, (for example) walk, at a slow pace or not able to walk	**5** 

Q.no 2) Feelings

Please point in the picture. During past 2 weeks…

How much have you been bothered by emotional problems such as feeling anxious, depressed, irritable or downhearted and sad?

Not at all	1 
Slightly	2 
Moderately	3 
Quite a bit	4 
Extremely	5 

Q.no. 3) Daily activities

Please point in the picture. During the past 2 weeks…

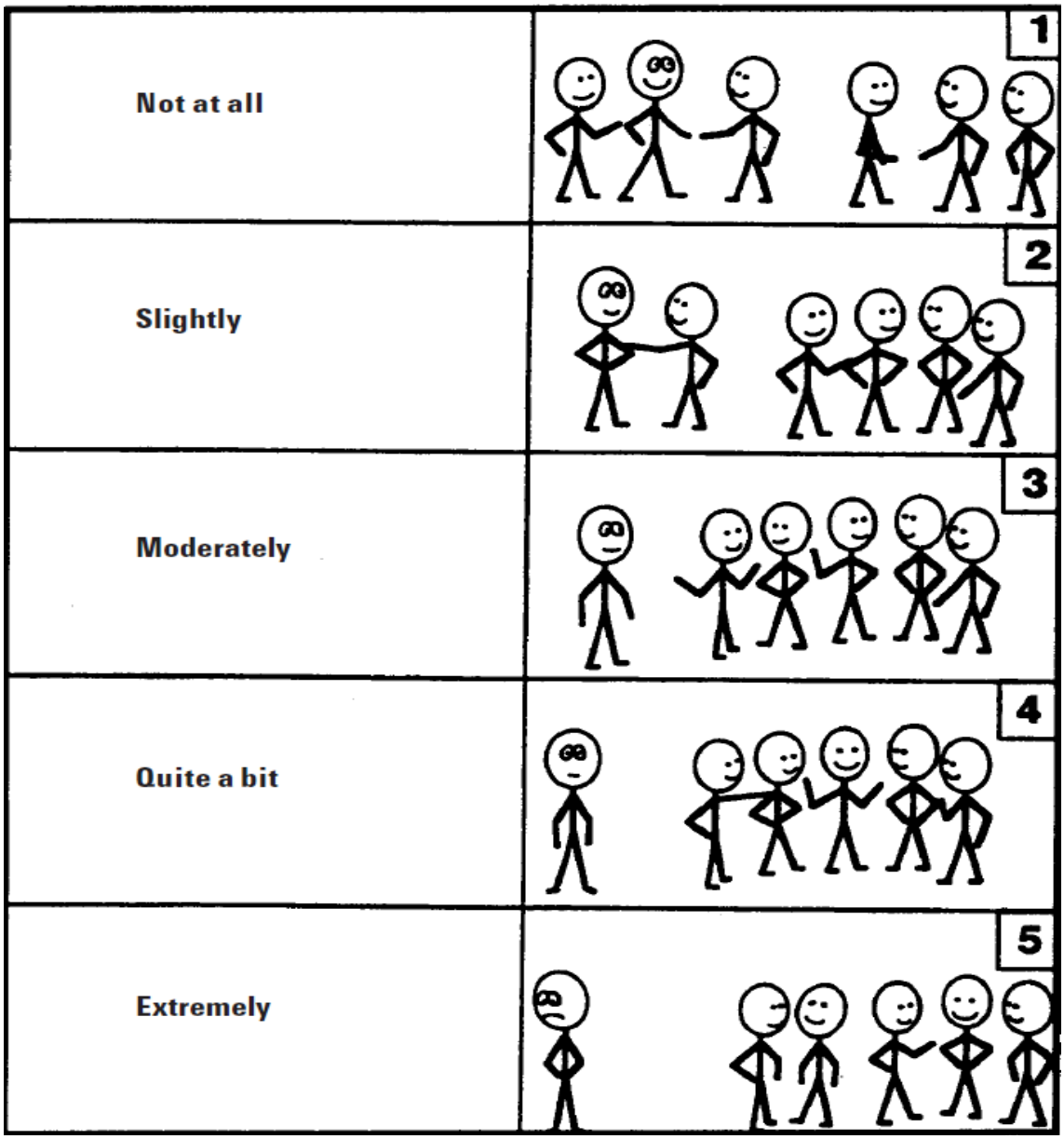
How much difficulty have you had doing your usual activities or tasks, both inside and outside the because of physical and emotional health?

No difficulty at all	1 
A little bit of difficulty	2 
Some difficulty	3 
Much difficulty	4 
Could not do	5 

Q.no. 4) Social Activities

Please point in the picture. During the past 2 weeks…

Has your physical and emotional health limited your social activities with family, friends, neighbor or groups?



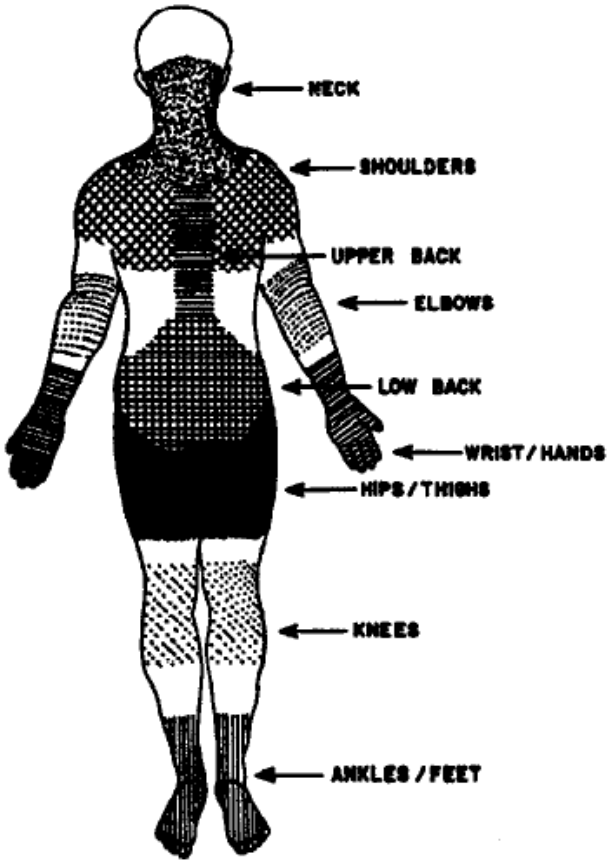
Q.no 5. The following questions are about ache, pain or discomfort in different parts of the body

Trouble with the locomotive organs

Have you at any time during the last 12 months had trouble (ache, pain, discomfort) in:	To be answered only by those who have had trouble: Have you at any time during the last 12 months been prevented from doing your normal work (at home or away from home) because of the trouble?	To be answered only by those who have had trouble: Have you had trouble at any time during the last 7 days?
Neck 1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes
Shoulders 1 ☐ No 2 ☐, in the right shoulder 3 ☐ Yes, in the left shoulder 4 ☐ Yes, in both shoulders	1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes
Elbows 1 ☐ No 2 ☐ Yes, in the right elbow 3 ☐ Yes, in the left elbow 4 ☐ Yes, in both elbows	1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes
Wrists/hands 1 ☐ No 2 ☐ Yes, in the right wrist/hand 3 ☐ Yes, in the left wrist/hand 4 ☐ Yes, in both wrists/hands	1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes
Upper back 1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes
Low back (small of the back) 1 ☐ No 2 ☐	1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes
One or both hips/thighs 1 ☐ No 2 ☐	1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes
One or both knees 1 ☐ No 2 ☐	1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes
One or both ankles/feet 1 ☐ No 2 ☐	1 ☐ No 2 ☐ Yes	1 ☐ No 2 ☐ Yes

Instructions for data collectors (In this picture you can see the approximate position of the parts of the body referred to the questionnaire. Limits are not sharply defined and certain parts overlap. You should decide for yourself in which part you have or have had your trouble (if any)).

In the picture, please point the part where you had pain?



Q.no.6) Have you, during the last 12 months, used following strategies to manage your musculoskeletal symptoms?

Went to doctor

Went to physiotherapist

Went to traditional healer

If went to other or did something else please specify

Scoring sheet for Interviewer

Q.no.1) Physical fitness

1 2 3 4 5

Q.no.2) Feelings

1 2 3 4 5

Q.no.3) Daily activities

1 2 3 4 5

Q.no.4) Social Activities

1 2 3 4 5

Q.no.6)

1 2 3 4