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Incidence of musculoskeletal pain and its related functional disability in geriatric urban and rural population of Patiala district

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Abstract
Background: Population ageing is a worldwide process. The common health conditions which elderly suffer are Musculoskeletal (MSK) problems. The purpose of the present study was to find the incidence of musculoskeletal pain and its related functional disability in geriatric urban and rural population of Patiala district.
Method: A survey study, total sample size was of 300 geriatric population (age between 60-74years) in which 150 each from urban and rural area of Patiala district. To find out desired result the pain related functional disability with the COPCORD Core questionnaire was assessed.
Result: Most commonly affected sites were knees, shoulders and cervical respectively in both the populations. The incidence of pain estimates were 14.3% at knee, 12.7% at shoulder and 8.7% at cervical region in total sample. Analysis using chi- square test to evaluate the significance of difference between means of two variables. The cut off level of significance was set at $\alpha = 0.05$. And it has been found that the pain on ability to work in both urban and rural population equally affected both (p=0.475).
Conclusion: From the result it is concluded that the incidence of knee joint involved in pain was high in both Urban and Rural elderly population followed by shoulder pain. MSK pain has a profound impact on functional disability and daily individual tasks.

Keywords: Population, MSK problems, urban, rural, COPCORD core questionnaire

Introduction
Population ageing is a worldwide process [1]. An increase in the life expectancy has a disadvantage that it predisposes the elderly to bear the brunt of chronic conditions especially the non-communicable and age related disorders. The common health conditions which elderly suffer are Musculoskeletal (MSK) problems, hypertension, cataract, COPD and other respiratory problems [2]. According to the World Health Organization (WHO), one of the major disabling conditions among the elderly population is MSK (MSK) disorders [3]. Globally, the impact of MSK conditions is wide as it directly impacts the quality of life. MSK conditions are very common across the elderly group and the spectrum of musculoskeletal diseases is varied [4].
The term 'MSK conditions' include a range of common conditions, including back pain, shoulder pain, elbow pain, hand pain, and hip and knee pain [5]. The WHO has specifically identified four major disabling MSK conditions: osteoarthritis (OA), rheumatoid arthritis (RA), osteoporosis (OP), and back pain (BP) [6]. WHO and ILAR conjointly firmed COPCORD in 1981 with primarily an aim to gather data on pain and disability associated with MSK in developing countries. MSK pain has been projected as a major health problem in all the COPCORD surveys undertaken in both developed and developing nations [7]. Some studies reported higher prevalence of MSK pain in rural population of India and Iraq. Conversely, some found the opposite that MSK pain-related disability and pain intensity were more prevalent in urban settings in South-eastern state of Indonesia and Mexico. [8-11]. outstandingly, comparison of COPCORD surveys from different countries showed high fluctuation from 13.33% of MSK pain in Shanghai, China to 66% in Rural Iran. A study done in Ireland, 67% of the respondents had significant reduction in their quality of life due to MSK pain [12]. However these surveys have been conducted with a similar sampling methodology and case

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definition, it seems that the variations in incidences are real and could be related to the ethnic, demographic, economic, or biological differences among the populations. Since all previous data reinforce the need for more epidemiological studies to determine the epidemiological influence of rheumatic diseases, we performed the present cross-sectional, population, stage 1 phase II COPCORD methodology-based study to assess the prevalence of MSK pain and its impact on health quality of life in District Patiala.

A very few studies have been conducted to determine the incidence of MSK disorders using WHO-ILAR COPCORD Questionnaire. In India, this questionnaire was first used by Arvind Chopra in Bhigwan (Pune). He conducted a survey on Urban and rural population for Rheumatic and MSK disorders in general population. This study is being done, to assess the prevalence of pain and related functional disability in the absence of expensive investigations by simple clinical measures and which aims to identify the gap in MSK pain in Rural versus Urban population of elderly population in Patiala District if any.

Methods
Nature of the present study is survey. In this study, elderly population from Urban and Rural part of Patiala district, who had a history of joint paint or had at the time of survey were included using a Questionnaire. Source of sample is Senior citizen welfare association, model town, Patiala, Punjabi University dispensary, Patiala, Door to Door visit and Primary Health Centre, Bir Bahadurgarh. The method of sampling was random sampling. 300 subjects between ages 60-74 year were included in the study. We determined the total random sample of n=300 (Urban, n=150; Rural, n=150), considering the following Inclusion criteria:
1. 60 - 74 years subjects from Urban Patiala suffering (ed) from MSK pain.
2. 60 - 74 years of subjects from Rural Patiala suffering (ed) from MSK pain.

Exclusion criteria
1. Elderly with congenital deformities, deformities due to infections, neoplastic causes, metabolic, trauma and neuromuscular disorders.
2. Elderly with a history of fracture or any surgical history of joints.
3. Post-surgical conditions of visceral organs, heart and lungs.
4. Non Cooperative elderly

The survey was successfully done in Rural and Urban Patiala district among geriatric age group by personal interview. The Elderly population was surveyed with Urban data collected from Bhai khan Singh Dispensary, Punjabi University, Senior Citizen Welfare Association, Patiala and door to door visits in Urban Estate, Patiala whereas the Rural data was collected from Primary health centre, Bir Bahadurgarh, Patiala and door to door visit in that area 150 each respectively making total sample of 300.The AIM of the survey was explained to each respondent and consent form was obtained duly signed by each. The COPCORD Core questionnaire to be filled after complete explanation to the respondent required 20 minutes each. Questionnaire has 2 parts: Part I is aimed at detection of respondents with musculoskeletal (MSK) pain (positive respondents) with some elaboration of the complaints and questions on help-seeking behaviour and functional disability. In this study part I is used. A subject was considered a positive

respondent if he/she reported occurrence of pain at muscles, bones, joints, or in any part of the body (MSK pain) within the preceding week. The respondent in whom MSK pain appeared, developed, or disappeared in the preceding week was also labelled as a positive. "Disability" was defined as mild difficulty to complete inability in performing any of following 10 activities due to MSK pain within the preceding year: dressing, walking, lifting glass to mouth, bathing, getting in and out of bed, getting into a car or rickshaw, bending, lifting, stair-climbing, and squatting.

Result
The data was analysed using the SPSS version 20.0 (SPSS Inc., Chicago, IL, USA) for Windows 7 Professional.

Table 1: Frequency of Joints involved in Pain during last 7 days (current) in 150 Geriatric Population of Urban Area and Rural Area.

Joint pain	Urban Area		Rural Area	
	N	Frequency%	N	Frequency%
Cervical	12	8.0%	14	9.4%
Lumbar	13	8.6%	7	4.6%
Shoulder	21	14.0%	17	11.4%
Elbow	11	7.4%	9	6%
Wrist	11	7.4%	15	10%
Hip	9	6.0%	18	12%
Knee	62	41.4%	62	41.4%
Ankle	11	7.4%	8	5.4%
Total	150	100%	150	100%

Table 1: shows Frequency of sites of maximum current musculoskeletal pain of joint from last 7 days in Geriatric population of Urban and rural area. The Table shows that most of the population living in Urban area suffers from Knee pain. In rural area a significant difference was found among the various regions of the body affected with musculoskeletal disorders. The Table shows that most of the population in the rural area suffer from Knee pain among both Male & Female.
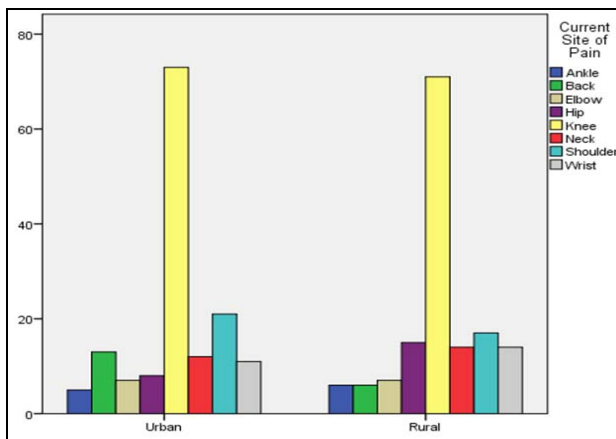

Fig 1: Involvement of Joints in Musculoskeletal Pain in the Current (last 7 days) in Geriatric Population of Urban & Rural area

Table 2: shows Frequency of sites of musculoskeletal pain of joint in the past (earlier than 7 days) in Geriatric population of Urban and rural area. The Table shows that most people have Knee pain and Shoulder pain from more than 7 days and people had a less pain with the Wrist joint in the Urban region. In rural population can be seen that most affected joint in the body for Rural population during several days is the knee with almost no difference between lumbar and shoulder involved with pain and very less people complained about Ankle.

Table 2: Frequency of Joints involved in Pain in the Past (earlier than 7 days) in 150 Geriatric Population of Urban Area and Rural Area.

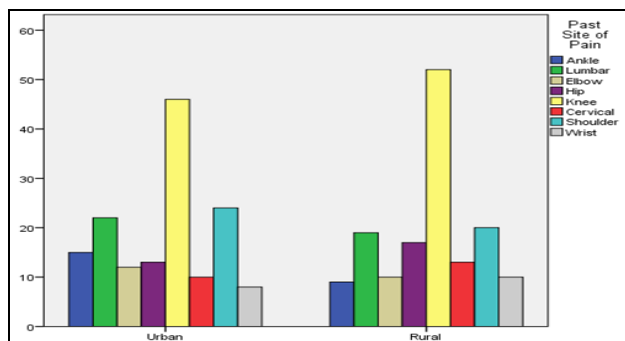| Joint pain	Urban Area		Rural Area	
	N	Frequency %	N	Frequency %
Cervical	10	6.6%	13	8.6%
Lumbar	22	14.6%	19	12.6%
Shoulder	24	16.0%	20	13.4%
Elbow	12	8.0%	10	6.6%
Wrist	8	5.4%	10	6.6%
Hip	13	8.6%	17	11.4%
Knee	46	30.6%	52	34.6%
Ankle	15	10%	9	6.0%
Total	150	100%	150	100

Fig 2: Involvement of Joints in Musculoskeletal Pain in the past (earlier than 7 days) in Urban and Rural Geriatric Population of Urban & Rural area

Table 3: Impact of Pain on Functional Disability among Geriatric Population in Urban and Rural area. Effect on Ability to Work. Criteria for Mild, Moderate, Severe

Mild	does the household work with bearable pain						
Moderate	does the household work but takes rest in between						
Severe	not able to do the household work						
Ability To Work	None	Mild	Moderate	Severe	Chi- quare Value	df	p-value
Urban	23	70	54	3	2.500	3	0.475
Rural	15	70	60	5			

*$p<0.05$ = Significant

Table 3: For the effect of pain on Ability to Work in both Urban area the calculated chi-square value for degree of freedom 3 was 2.500. It indicates the significance value of 0.475 is greater than the threshold value of 0.05. This shows that there was a not significant difference of effect of pain on Ability to Work among Geriatric population in Urban and Rural areas. The ability to work was equally affected in both the populations.
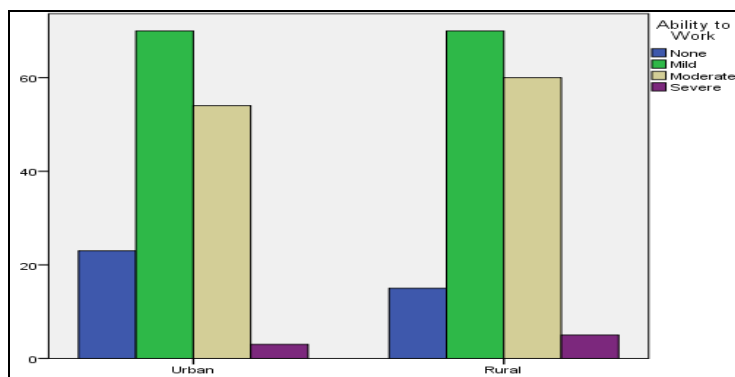

Fig 3: Impact of Pain on Functional Disability among Geriatric Population in Urban and Rural area. Effect on Ability to Work.

Table 4: HAQ-DI of the Geriatric Population of Urban and Rural area

Group Statistics								
Task	Group	N	Mean	Std. Deviation	Std. Error Mean	t value	Mean difference	Sig
Dressing	Rural	150	1.03	1.226	0.100	4.550	0.673	0.000*
	Urban	150	1.70	1.335	0.109			
Rising	Rural	150	2.04	1.117	0.091	1.419	-0.187	0.157
	Urban	150	1.85	1.161	0.095			
Eating	Rural	150	1.80	1.452	0.119	0.871	0.147	0.384
	Urban	150	1.95	1.465	0.120			
Walking	Rural	150	2.37	1.312	0.095	3.355	-0.480	0.001*
	Urban	150	1.89	1.162	0.107			
Hygiene	Rural	150	2.18	1.106	0.090	0.096	-0.013	0.924
	Urban	150	2.17	1.292	0.106			
Reaching	Rural	150	1.89	1.280	0.105	10.930	1.180	0.000*
	Urban	150	3.07	0.330	0.027			
Grip	Rural	150	1.63	1.353	0.110	0.255	0.040	0.799
	Urban	150	1.67	1.363	0.111			
Activities	Rural	150	2.04	1.092	0.089	0.161	-0.020	0.873
	Urban	150	2.02	1.065	0.087			

*Significant at $p<0.05$ Level

Table 4: shows the comparison of Dressing between Urban (1.70±1.335) and Rural area (1.03±1.226). The data shows that Rural population was more affected than Urban population. The comparison of Rising between Urban (1.85±1.161) and Rural (2.04±1.117) area has done, the results were not significant (p=0.157). This showed that Rising was equally affected in both populations. The comparison of Eating/Cooking between Urban (1.95±1.465) and Rural (1.80±1.452) area Geriatric Population has done, the results were not significant (p=0.384). This showed that Eating/cooking was equally affected in both populations. The comparison of Walking between Urban (1.89±1.162) and Rural (2.37±1.312) area Geriatric Population has done, the results were significant (p=0.001). This showed that rising was not equally affected in both populations. The data shows that Urban population was more affected than Rural population. The comparison of Hygiene between Urban (2.17±1.292) and Rural area (2.18±1.106) Geriatric Population has done, the results were not significant (p=0.924). This showed that Hygiene was equally affected in both populations. The comparison of Reaching between Urban (3.07±0.330) and Rural (1.89±1.280) area Geriatric Population has done, the results significant (p=0.000). This showed that Reaching was not equally affected in both populations. Rural population was more affected than Urban population. The comparison of Grip between Urban (1.67±1.363) and Rural (1.63±1.353) area Geriatric Population has done, the results were not significant (p=0.779). This showed that Grip was equally affected in both populations. The comparison of Activities between Urban (2.02.±1.065) and Rural (2.04±1.092) area Geriatric Population has done, the results were not significant (p=0.873). This showed that Activities was equally affected in both populations.

Discussion

COPCORD was born due to a need to gather data on pain and MSK disorders with an emphasis on developing Rural economies. Joshi and Chopra, found a difference in epidemiology of pain in Rural and Urban population in their Pune Bhigwan model. [8] Clearly, the presence of joint pain does not reflect how pain affects older population on daily basis. Therefore, this study was an attempt to commend comparative results of the incidence of MSK pain and their functional disabilities among Urban and Rural geriatric population to know if there a gap.

Section A: Incidence of MSK Joint Pain

Number of pain locations is an important contributor to disability in geriatric population. [13] In this study, Urban geriatric 150 respondents, 11 at ankle, 13 at lumbar, 11 at elbow, 9 at hip, 62 at knee, 12 at cervical, 21 at shoulder, 11 at wrist had pain. In Rural area, out of 150 respondents, 8 at ankle, 7 at lumbar, 9 at elbow, 18 at hip, 62 at knee, 14 at cervical, 17 at shoulder and 15 at wrist joints had pain during the current period.

WHO reported that MSK conditions have a major societal impact in terms of reduced work disability? OA knee was most common disorder in urban community. Higher prevalence of knee pain in Urban is seen in many COPCORD studies [8]. Knee was the most common site of pain in Bangladesh, Shanghai, Rural India, Urban Mexico [9-11]. Prevalence of shoulder pain in Pune and Bhigwan region was found to be 2.5% and 7.6% respectively. In our study shoulder was the second most affected joint after knee in both the Urban and Rural population of Patiala district. Many community studies

have shown that at least a quarter of elderly have shoulder pain [14]. The increase incidence of shoulder pain may be possibly due to Rural female involved in everyday task of carrying cow dung on their heads which shoulder overhead abducted and males working in field, plough the fields with instrument manually.

The incidence of musculoskeletal pain in all sites was significantly higher in the urban than the rural populations. The impact of joint pains can be gauged by the association of pain with poor mobility, Activities of daily living dependency, falling [15].

Section B: Impact on Pain on Functional Disability

In Urban population, Ability to Work with respect to the pain, 7.7% stated no effect, 23.3% stated mild effect, 18.0% stated moderate effect and 1% stated a severe effect. Among Rural population, 5% stated no effect, 23.3% stated a mild effect, 20% stated a moderate effect and 1.7% stated a severe effect. Overall the Ability to Work showed a significant impact by 12.7% stating no effect, 46.7% stating mild effect, 38% stating Moderate effect and 2.7% stating severe effect. The effect of pain on their leisure activities was 22.7% as no effect, 12.3% as Mild. 6.1% as Moderate and 0.6% as Severe among Urban population. And 17.2% as None, 17.2% as Mild, and 23.9% as moderate among Rural population. An overall impact of 39.9% None, 29.4% Mild and 30.1% Moderate effect can be seen.

Section C: Impact of Pain on Daily Individual Tasks

A study showed that 60% of women aged 75 had significantly higher levels of disability, compared with only 41% of men of the same age.

The t values 1.419, 0.871, 0.096, 0.255, 0.161 were not significant at 95% level of significance with degree of freedom 198. This shows that the mean score of the geriatric population of Urban and Rural area on Rising, eating, Hygiene, Grip and in Activities do not differ significantly in both communities. The t-value of 4.550, 3.355, 10. 930 were significant at 95% level of significance. This showed that dressing, walking and reaching were most affected both in urban and rural population. Knee and lumbar were the commonly reported pain sites. This matched well with the individual's activities like sit cross legged on floor and get up, climb up 5 stairs, reach and get down a 2 kg heavy object from just above head and get in and out of bus, scored high in HAQ, effects both populations equally.

Global disability was high among reporting shoulder. Shoulder pains aren't considered globally as a disability because most of the household tasks don't involve arm elevation above 90 degrees Patiala is a Sikh dominated city the inability to tie turban (considered as a part of tradition) was the basic complaint which requires > 90 degree elevation of arm. Activities like combing hair, washing hair requires shoulder movements and were more affected in Rural population. Studies conducted in the developed nations have also shown a high prevalence of MSK disorders and their negative effect on the HRQL, as compared to other chronic disorders (Alonso et al., 2004) in a study done in Ireland, 67% of the respondents had significant reduction in their quality of life due to MSK pain [12]. Research conducted in Manchester indicated that disability due to MSK pain was high for Indian and Bangladeshi people than White [16].

Conclusion

From the result it is concluded that the incidence of knee joint involved in pain was high in both Urban and Rural elderly population. The second most affected joint involved was shoulder Urban and Rural while Low back pain was reported to be more in females particularly Rural population (19.17%) than Urban (18.97%). The characteristic of pain in both urban and rural population was different due to different set of daily activities involved. As most of the MSK conditions remain fairly common in the elderly populations as seen in this study. MSK pain has a profound impact on functional disability and daily individual tasks.

Suggestions: Further studies can take another Rural community with a larger sample size. ACR classification can be used to categorise the Musculoskel *et al* disorders in both the communities. Prospective studies can be done that evaluate the risk factors and the role of potential variables if any and also to quantify the impact of MSK pain on family and society.

References

1. Miranda VS, Vivielle BF, Machado LA, Dias JMD. Prevalence of chronic musculoskeletal disorders in elderly Brazilians: a systematic review of the literature. BMC musculoskeletal disorders, 2012; 13(1):82.
2. Medhi GK, Hazarika NC, Borah PK, Mahanta J. Health problems and disability of elderly individuals in two population groups from same geographical location. JAPI; 2006; 54:539-544.
3. Ruhe Alexander, Fejer Rene. What is the Prevalence of Musculoskeletal problems in the elderly population in developed countries? A systematic critical literature review. Chiropractic and Manual therapies. 2012; 20:31.
4. Mourao AF, Blyth FM, Branco JC. Generalised musculoskeletal pain syndromes. Best Practice & Research Clinical Rheumatology; 2010; 24(6):829-840.
5. Brighton, Hove. Musculoskeletal Conditions. JSNA, 2013.
6. Ruhe Alexander, Fejer Rene. What is the Prevalence of Musculoskeletal problems in the elderly population in developed countries? A systematic critical literature review. Chiropractic and Manual therapies; 2012; 20:31.
7. Chopra A, Abdel-Nasser. Epidemiology of rheumatic musculoskeletal disorders in the developing world. Best Practice & Research Clinical Rheumatology; 2008; 22(4):583-604.
8. Joshi JL, Chopra A. Is There an Urban-Rural Divide? Population Surveys of Rheumatic Musculoskeletal Disorders in the Pune Region of India Using the COPCORD Bhigwan Model. J Rheumatol; 2009; 36:614-22.
9. Haq SA, Darmawan J, Islam M. Prevalence of rheumatic diseases and associated outcomes in Rural and Urban communities in Bangladesh: A COPCORD study. The Journal of Rheumatology; 2005; 32:348-353.
10. Darmawan John, Valkenburg A Hans, Muirden D Kenneth, Wigley D Richard. Epidemiology of rheumatic diseases in Rural and Urban populations in Indonesia: A World Health Organisation International League against Rheumatism COPCORD study, stage I, phase 2. Annals of the Rheumatic Diseases. 1992; 51:525-528.
11. Pelaez-Ballestas I, Sanin LH, Moreno-Montoya J, Alvarez-Nemegyei J, Burgos-Vargas R, Garza-Elizondo, M *et al*. Epidemiology of the rheumatic diseases in Mexico. A study of 5 regions based on the COPCORD methodology. The Journal of Rheumatology; 2011; 86:3-8.
12. Veale DJ, Woolf AD, Carr AJ. Chronic musculoskeletal pain and arthritis: impact, attitudes and perceptions. Ir Med J. 2008; 101:208-210.
13. Scudds R, Robertson M. Empirical evidence of the association between the presence of musculoskeletal pain and physical disability in community-dwelling senior citizens. Pain; 1998; 75:229-35. [PubMed: 9583758]
14. Hazeleman BL, Chard MD. Shoulder Disorders in Elderly. Annals of the Rheumatic Diseases. 1987; 46:684-687.
15. Donald IP, Foy C. A longitudinal study of joint pain in older people. Rheumatology; 2004; 43(10):1256-1260.
16. Allison TR, Symmons DPM, Brammah T, Haynes P, Rogers A, Roxby M *et al*. Musculoskeletal pain is more generalised among people from ethnic minorities than among white people in Greater Manchester. Annals of the rheumatic diseases; 2002; 61(2):151-156.