

# Burden of Rheumatic Diseases in A Rural Community of Bangladesh

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## Abstract

**Objective:** To estimate the magnitude, burden of illness and help-seeking behavior of patients with musculoskeletal complaints and to provide incidence of osteoarthritis, low back pain, fibromyalgia, rheumatoid arthritis, gout, and other inflammatory and non-inflammatory rheumatic diseases in a rural community of Bangladesh.

**Methods:** The study was conducted in a few villages near Dhaka city which were considered to be a fairly representative sample of Bangladeshi rural population. Data were collected with the help of modified Community Oriented Program for Control of Rheumatic Diseases (COPCORD) questionnaire and a diagnosis using American College of Rheumatology (ACR) criteria was established.

**Results:** During the 18 months study period, 2685 adults (15 years and above) were included. A total of 441 (M=163, F=278) developed new musculoskeletal (MSK) pain. The incidence rates were 10.9/100 person-years (PY) for the whole population, 8.2/100 PY for males and 13.6/100 PY for females. Nonspecific low back pain (NSLBP), fibromyalgia and osteoarthritis of knee were common MSK problems. A total of 302 patients had complaints of low back pain, of them 204 persons had noninflammatory low back pain; 262 respondents had complaints of knee pain, 38 had satisfied the criteria of knee OA; a total of 116 respondents suffered from fibromyalgia during the study period. Of the respondents (M=17, F=24) 41 had inflammatory arthropathy. Among the incidences of inflammatory arthritis, rheumatoid arthritis 120 (M=101, F=147), spondyloarthropathies 150 (M=252, F=49), ankylosing spondylitis 75 (M=151, F=0), reactive arthritis 50 (M=101, F=0), and psoriatic arthritis 256 (M=0, F=49) per 100,000 / PY respectively were observed,

**Conclusions:** Rheumatic diseases are common in the rural community of Bangladesh, affecting nearly a quarter of adult population. Non-specific low back pain (NSLBP), fibromyalgia and osteoarthritis of knee joints are common joint disorders; point prevalence estimates of most common diagnoses were similar to other community surveys using COPCORD methodology.

**Key words:** Epidemiology study, Rheumatic diseases, rural community, Bangladesh.

## Introduction:

Modern trends in the prevalence and effects of rheumatic conditions must be considered in relation to increasing life expectancy and increasing population problems, such as rapid growth of urban populations, new occupational stresses, lifestyle changes and a number of other factors.<sup>1</sup>

COPCORD is an initiative of the World Health Organization (WHO) and International League of Associations of

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Rheumatology (ILAR). In 1981 the WHO and ILAR initiated the project<sup>2</sup> with the primary objective to control rheumatic diseases by both prevention and treatment of pain and disabilities.

The low quality of life in rheumatic diseases induces chronic unquantifiable psychosocial suffering of the patients and their families.<sup>3</sup> The cost to the United States economy attributed to musculoskeletal disorders is more than 20 billion dollar per annum.<sup>4</sup>

The prevalence of the major rheumatic diseases has been extensively studied in the West for several decades but figures from the third world are only just emerging.<sup>5</sup>

Rheumatic disorders are neglected health problems in Bangladesh and probably no control program has been introduced so far mainly because of lack of necessary information. Communicable diseases were once the main causes of morbidity and mortality but due to the adoption of various public health measures, both at government and non-government levels, the morbidity due to these diseases are now reduced to a great extent.<sup>6</sup>

**Materials & Methods:**

The population of Sonargaon Upazila of Narayanganj district was selected for prevalence and incidence study of musculoskeletal diseases in the rural population. This area was selected as being representative of rural population of Bangladesh in respect of socio-demographic characters such as life expectancy, age structures, sex distribution, income, cultures, religion, occupations and social classes. A total population of 2685 (M=1324, F=1361) of age 15 years and above was interviewed. In this study data were collected with the help of modified COPCORD questionnaire. The questionnaire was translated to Bengali, cross-cultural adaptation and validation were also done. Non-probability sampling method was adopted for the study.

**Observations and results:****Socio-demographic parameters:**

The socio-demographic characters of the sample population are shown in the table 1. The mean age of sample population was 33.18 + 15.53 years. A total of 2685 persons were interviewed. Out of them 163 male and 278 female patients had complaints of new rheumatic problems, 1161 male and 1053 female had no new complaints. Regarding new complaints female preponderance was more than male (Chi square = 23.16,  $p < 0.001$ ), married population of the sample was 72.8%. By occupation, there were 40.9 % housewives, 13.4 % laborers, 10.4% business, 6.8 service holders and 4.8% farmers. The distribution of rheumatic complaints by age group and sex are shown in the table 2. The annual incidence of rheumatic complaints increased in middle age group. It was 9.2% in the age group of 15 to 24 years. In age groups of 35 - 44 years and 45 - 54 years, the rates were 26.3% and 24.7% respectively. It was 15.5% in case of 65 and above age group. There was significant difference in the annual incidence of rheumatic complaints among the middle age group, younger age group and older age group (Chi square 51.48,  $p < 0.001$ ) (Fig.-1). More than 20.9 percent of the farmers suffered from rheumatic symptoms, the rate was significantly higher than that of service holders and business professionals (Chi square = 6.58,  $p < 0.05$ ). By occupation rheumatic disorders were also common in housewives with an annual incidence of 24.4/100 person years. The incidence of rheumatic disorders among laborers was 13.1/100 person years and those of service holders and business professionals were 7.7/100 person years and 12.9/100 person years respectively (Table 3). Functional disability in one or more of the common activities was reported by 99.5% of 440 new positive respondents with the mean duration of 34.44 (SD±33.68) days (Table 5). Regarding functional limitations, the most commonly affected activities were squatting (84.1%), getting up and down from bed (80.2%), picking up objects

from the floor (78.9%), getting up and down from vehicle (54.1%), climbing up and down stairs (65.7%) and bathing (65.7%).

**Table - I***Socio-demographic character of study population.*

Background characteristics	Number	Percentage
Age (years)		
Mean±SD	33.18±15.53, Range 15-99	
<b>Sex</b>		
Male	1324	49.3
Female	1361	50.7
<b>Occupation</b>		
Agriculture	129	4.8
Labor	351	13.4
Service	182	6.8
Business	278	10.4
House wife	1098	40.9
Student	180	6.7
Weavers	109	4.1
No work	130	4.8
Others	220	8.2
<b>Marital status</b>		
Married	1956	72.8
Single	582	21.7
Widow	128	4.4
Widower	11	0.4
Separated	11	0.4
Divorced	7	0.3
<b>Education</b>		
Primary	581	21.6
Secondary +	530	19.7
Graduate +	29	1.1
Read/sign	398	14.8
Illiterate	1147	42.7
<b>Economic status</b>		
Upper	37	1.4
Middle	771	28.7
Lower	1877	69.9

**Table-II**

*Incidence by age group and sex distribution  
(Data in the parentheses indicate percentages)*

Age in Year	Interviewed population			Positive respondent		
	Male	Female	Total	Male	Female	Total
15-24	456 (34.4)	526 (38.6)	982 (36.6)	32 (7.0)	58 (11.0)	90 (9.2)
25-34	342 (25.8)	291 (21.4)	633 (23.6)	43 (12.6)	60 (20.6)	103 (16.3)
35-44	217 (16.4)	224 (16.5)	441 (16.4)	33 (15.2)	83 (37.1)	116 (26.3)
45-54	137 (10.3)	142 (10.4)	279 (10.4)	29 (21.2)	40 (28.2)	69 (24.7)
55-65	92 (6.9)	103 (7.6)	195 (7.3)	13 (14.1)	26 (25.2)	39 (20.0)
65+	80 (6)	75 (5.5)	155 (5.8)	13 (16.3)	11 (14.7)	24 (15.5)
Total	1324 (100)	1361 (100)	2685 (100)	163	278	441

**Table-III**

*Incidence by occupation*

Occupation	Interviewed population		Positive respondent	
	Number	Percent	Number	Percent
Agriculture	129	4.8	27	20.9
Labour	359	13.4	47	13.1
Service	182	6.8	14	7.7
Business	278	10.4	36	12.9
House wife	1098	40.9	268	24.4
Student	180	6.7	15	8.3
Weavers	109	4.1	24	22.0
Others	220	8.2	10	4.5
No work	130	4.8	-	-
Total	2685	100.0	441	16.4

**Table-IV**

*Incidence of rheumatic complaints by site.*

Joint and region	Male (n=1324)	Female (n=1361)	Total (n=2685)	
	%	%	%	95 % CI
Spine	5.7	14.2	11.0	9.88-12.28
Knee	6.7	12.5	9.6	8.57-10.85
Shoulder	6.7	11.5	9.2	8.11-10.33
Neck	4.2	8.0	9.0	7.97-10.18
Elbow	4.3	8.0	6.2	5.34-7.18
Ankle	4.8	7.0	5.9	5.04-6.86
Hip	2.9	6.0	4.5	3.77-5.38
Wrist	3.5	6.4	5.0	4.18-5.86
Hand	2.4	4.7	3.6	2.92-4.37
Foot	2.7	4.6	3.7	3.02-4.49
Others	1.1	.6	0.8	0.53-1.26

**Table-V**

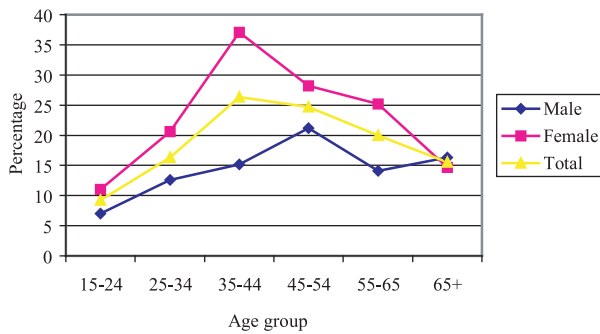
*Incidence of rheumatic disorders per 100 person years of observation*

Sex	Population interviewed	Positive respondent	Incidence rate (%)	95% CI
Male	1324	163	12.3	10.61-14.23
Female	1361	278	20.4	18.33-22.69
Total	2685	441	16.4	15.05-17.89

**Table-V**

*Incidence of rheumatic diseases per 100 person years of observation  
(Data in parentheses indicate incidence per 100 person years)*

Name of the diseases	Male n=1324	Female n=1361	Total n=2685	95% CI
Low back pain	51 (3.85)	113 (8.53)	164(6.11)	5.25-7.10
Fibromyalgia	42 (3.17)	74 (5.59)	116 (4.32)	3.60-5.18
Osteoarthritis of knee	16 (1.2)	22 (1.66)	38 (1.42)	1.02-1.96
Cervical spondylosis	14 (1.06)	16(1.21)	30 (1.12)	0.77-1.61
Lumbar spondylosis	17(1.28)	19(1.43)	36(1.34)	0.95-1.87
Myofascial pain syndrome	5 (0.37)	7 (0.52)	12 (0.45)	0.27-0.85
Frozen shoulder	4 (0.30)	9 (0.68)	13 (0.48)	0.44-1.13
Polyarthralgia	5 (0.38)	14 (1.06)	19(0.71)	0.44-1.13
Rheumatoid arthritis	4 (0.30)	9(0.68)	13(0.48)	0.27-0.85
Ankylosing spondylitis	8(0.60)	1 (0.07)	9(0.34)	0.16-0.66
Prolapsed disc	2 (0.15)	2 (0.15)	4 (0.15)	0.05-0.41
No abnormality	1 (0.07)	1 (0.07)	2 (0.07)	0.01-0.30
Psoriatic arthritis	-	1 (0.08)	1 (0.04)	0.01-0.24
Others	49 (3.70)	94 (6.93)	143(5.3)	4.52-6.26



**Fig.-1:** Incidence of rheumatic diseases by age group and sex

### Results of the examination phase:

The total incidence of rheumatic diseases was 16.4/100 person years of observation (95% CI 15.05-17.89) of the adult population aged 15 years and above (Table-V) and in male it was 12.3/ 100 person years of observation (95% CI 10.61-14.23) and in female 20.4/ 100 person years of observation (95% CI 18.33-22.69).

NSLBP (Table-VI) was the most common rheumatic disease and its incidence was 6.11/100 person years of observation (95% CI 5.25-7.10). Female suffered more often than the male (Chi-square test=20.53,  $p < 0.001$ ).

Fibromyalgia was the second most common rheumatic disease followed by osteoarthritis of knee. The incidence of fibromyalgia was 4.32/100 person years of observation (95% CI 3.60-5.18). Female was more affected than male (Chi-square test, 30.88  $p < 0.001$ ).

Osteoarthritis of knee appeared in 1.42% (95% CI 1.02-1.96). Both sexes were equally affected. The incidence of rheumatoid arthritis was 0.48/ 100 person years of observation (95% CI 0.27-0.85). Nine female and four male were diagnosed as rheumatoid arthritis.

Soft tissue rheumatism was present in 5.3% of population and this included all cases of epicondylitis, tendinitis, bursitis and tenosynovitis. Frozen shoulder was present in 0.48% of the population and it was more common in female.

Among the rheumatic patients, 21.5% had the history of loss of work for their disability due to musculoskeletal problems. The mean duration of work loss due to disability was  $7.71 \pm 14.59$  days in the preceding months.

### Discussion:

The present study is the first of its kind in Bangladesh in a defined rural population for the estimation of prevailing new cases of rheumatic morbidity in eighteen-month period. The response rate was as high as in other COPCORD studies.

Out of 2685 persons, 441 (male-163, female-278) had new rheumatic complaints during this period. Overall incidence of rheumatic diseases was 16.4/100 person years of observation (95% CI 15.05-17.89). Female suffered significantly more than the male ( $p < 0.001$ ). An attempt was made to identify the associations between occurrence of rheumatological morbidities and variables like socio-demographic factors such as life expectancy, age structures, sex distribution, income, culture, religions, occupations and social classes. Common as well as uncommon rheumatic disorders were also identified. Data collection by trained interviewer was satisfactory in that data of modest sophistication were collected from a large population. The low cost approach had been shown to be suitable for the study in developing countries.<sup>7</sup> Nonspecific low back pain was the most common disorder and its incidence was 6.11/100 person years (95% CI 5.25-7.10) followed by fibromyalgia, 4.32/100 person years (95% CI 3.60-5.18). A female preponderance was observed in almost all rheumatic disorders. The differences of incidence between male and female were significant, in cases of low back pain (male-51 vs. female-113,) and fibromyalgia (male-42 vs. female-116). Four men and nine women were diagnosed as rheumatoid arthritis with an incidence of 0.48/100 person years of observation (95% CI 0.27-0.85). Peoples of both sexes equally complained of their disabilities and functional limitations in one or more of the daily activities (male-100% vs. female-99%) and 22% had the history of loss of work for a mean duration of 7.71 days. As in most of the COPCORD studies, the low back pain ranked first among the individual pain sites with an incidence of 6.11/100 person years, it was 3.85% in male and 8.53% in female; the common posture in local culture is squatting both in domestic and work related activities, this finding contradicts Farhni's suggestion that squatting protected villagers in India who were said not to have back pain. Another remarkable finding in our study was a high incidence of fibromyalgia with an incidence of 4.32/100 person years, female suffered more than male. The high prevalence rates for fibromyalgia were also reported in USA 3.4% in women, 0.5% in men<sup>8</sup> in Pakistan (2.01%)<sup>5</sup>, and Norway with an annual incidence of 5.8% among women of 26-51 years.<sup>9</sup> Osteoarthritis was a common arthritis in all COPCORD studies. The incidence of osteoarthritis of knee was 1.42/ 100 person years with almost equal preponderance in both sexes. In COPCORD surveys, the prevalence of osteoarthritis of knee was 5.1%<sup>10</sup> in Indonesia, 3% in Filipino rural community,<sup>11</sup> 5.8% in rural area of India<sup>12</sup> and 3.7% in Pakistan.<sup>5</sup> The total annual incidence rates of osteoarthritis of knees were 28.7/100,000 person years of observation in Norway,<sup>13</sup> 0.15 to 0.36/1000 in Greece,<sup>14</sup> 39/100,000 of the



population of 16 years and above age in Finland,<sup>15</sup> 22 per 100,000 in man and 60 per 100,000 in woman in USA<sup>16</sup> in patients aged 18 or older.

In a Mexico study the most common sites of involvement were knee (12.3%); low back (6.3%); ankles (6%) and shoulders (5.3%).<sup>17</sup> In our study 67.6% patients of osteoarthritis of knees had BMI 18.5- 24.99, 24.3% had less than 18.5 and 5.4% were overweight or obese. In the villages where malnutrition and poverty are very frequent, obesity should not be expected at a high rate. Other physical factors such as weight bearing, carrying loads that cause injury to the knee may be responsible for osteoarthritis of knee.

The incidence of rheumatoid arthritis was 0.48%/100 person years with distinct female preponderance. The prevalence of rheumatoid arthritis in the developing countries has been ascribed to non-recognition of mild diseases, demographic variables such as reduced survival of women with and without RA, or the absence of environmental causative factors.<sup>5</sup> Wolfe<sup>18</sup> had a review from 14 studies, mainly from developed countries, according to the criteria of definite RA, the prevalence rate of 0.3 to 1.5% was found, with an overall figure of about 1%; a WHO-ILAR-COPCORD study of rheumatic diseases in rural area of India the prevalence was 0.68%,<sup>13</sup> and in the rural area of Philippine it was 0.2%.<sup>19</sup> Similarly the frequency of ankylosing spondylitis was at a low rate with an annual incidence of 0.34% almost identical to the findings of other COPCORD studies probably justifying the statement that inflammatory arthritis does not appear to be a common problem in the population of developing countries. The incidence of soft tissue rheumatism was 5.3%; it included all cases of epicondylitis, tendinitis, bursitis, tenosynovitis and myofascial pain syndrome. The higher prevalence among the illiterate people may be related to their earlier engagement in physical work.

The prevalence of gout in the Filipino rural area was 0.6%, Wigley et al and Chopra ET al<sup>19, 12</sup> have shown that 0.12% of rural population of India suffered from gout and no case was identified in rural area of northern Pakistan;<sup>5</sup> in this study no case of gout was identified.

The functional limitations in one or more of the common daily activities were found in 99.5% of the positive respondents. Squatting (84%), getting up and down from bed (80%) and bending or picking up objects ((79%) from the floor were commonly affected activities.

The point prevalence of NSLBP was 16.0% (95% CI-14.63-17.51) with female predominance (22.6% v 9.7%). The prevalence of NSLBP increased in middle age group, it was highest in the 35-44 age group both for men (17.3%) and

women (27%). In the developed countries prevalence of low back pain in the adult population is estimated at 14-31% with a 60-80% lifetime incidence.<sup>20</sup> In our study chronic low back pain occurred significantly and more frequently in the illiterate population, which was 21.1%, it was common in the housewives with a prevalence of 24.7%. In the work related activities, 23 percent of the farmers suffered from chronic low back pain, the rate were significantly higher than that of service holders and business professionals.

The definition of burden of disease includes a measure of function and health related quality of life (HRQOL) that is weighted by disease prevalence and rheumatic diseases as a group can be ranked alongside neurological, cardiac, or pulmonary conditions as a major disease.<sup>21</sup> The total economic burden of rheumatic diseases is often more substantial than other chronic conditions, including cardiovascular diseases and cancer; and the impact of the disability caused by musculoskeletal diseases is significant on both direct (long-term care in osteoporosis for example) and indirect costs like productivity loss in chronic patients.<sup>22</sup> The current study exposes a considerable burden of rheumatic diseases in the rural population of Bangladesh necessitating increased demand for awareness of the gravity of the prevailing situation, measures for prevention and control of problems in this regard. Mechanical and degenerative diseases are the main causes of morbidity, disability and work loss. Future studies should aim at identification of occupational and ergonomic risk factors of chronic low back pain; such studies should ideally include larger samples. Intervention studies should be designed to assess the effectiveness of modification of physical and environmental risk determinants for reducing low back pain morbidity.

**Conflict of Interest:** None

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