Prevalence of Rheumatic Diseases and Associated Outcomes in Rural and Urban Communities in Bangladesh: A COPCORD Study

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ABSTRACT. ***Objective.*** To estimate the burden of rheumatic disorders in adults (age ≥ 15 yrs) in Bangladeshi rural and urban communities.

Methods. The survey was carried out in a rural community, an urban slum, and an affluent urban community with samples of 2635, 1317, and 1259 adults, respectively. Through door-to-door surveys, trained interviewers identified subjects with musculoskeletal pain. A socio-culturally adapted and validated Bengali version of the COPCORD (Community Oriented Program for Control of Rheumatic Disorders) questionnaire was used. Trained internists and rheumatologists examined the positive respondents using an English COPCORD examination sheet to identify respondents with definite rheumatic disorders and to reach a diagnosis.

Results. The overall point prevalence of musculoskeleletal pain was 26.3%. The point prevalence estimates of musculoskeletal pain in rural, urban slum, and affluent urban communities were 26.2% (women 31.3%, men 21.1%), 24.9% (women 27.5%, men 22.6%), and 27.9% (women 35.5%, men 18.6%), respectively. Most commonly affected sites were low back, knees, hips, and shoulders in all 3 communities. The point prevalence of definite rheumatic disorders was 24.0%. The commonest rheumatic disorders were osteoarthritis of the knees, nonspecific low back pain, lumbar spondylosis, fibromyalgia, and soft tissue rheumatism. Their prevalence estimates were 7.5%, 6.6%, 5.0%, 4.4%, and 2.7%, respectively, in the rural, 9.2%, 9.9%, 2.0%, 3.2%, and 2.5%, respectively, in the urban slum, and 10.6%, 9.2%, 2.3%, 3.3%, and 3.3% in the urban affluent community. The point prevalence of functional disability was 25.5%, 23.3%, and 24.8%, respectively, in the rural, urban slum, and urban affluent communities. Among the positive respondents, 22%, 52%, and 22% reported loss of work for durations of 49.3 ± 47.5, 50.90 ± 103.3, and 29.25 ± 56.5 days, respectively, within the previous year.

Conclusion. Rheumatic disorders are common causes of morbidity, disability, and work loss in rural and urban communities of Bangladesh. Women are affected more frequently than men. Mechanical disorders are more common than inflammatory arthropathies. (J Rheumatol 2005;32:348–53)

Key Indexing Terms:

PREVALENCE	RHEUMATIC DISEASES	RURAL
URBAN	BANGLADESH	COPCORD

Prevalence data for major rheumatic disorders are available from the Western countries[1-3]. Rheumatic disorders appeared to be the commonest cause of chronic health problems and longterm disabilities[3,4]. With an appreciation of the socioeconomic impact of these crippling disorders, the World Health Organization (WHO) and the International League of Associations for Rheumatology (ILAR) jointly founded the Community Oriented Program for Control of Rheumatic Disorders (COPCORD) in 1981. Initiated by COPCORD, studies on prevalence of rheumatic disorders

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have been conducted in some developing countries[5-11]. We present data from the COPCORD study in rural and urban communities of Bangladesh, a developing country in South Asia.

MATERIALS AND METHODS

Three localities were selected as being representative of the social spectrum of Bangladesh. Bhargaon union is a cluster of small villages with 2635 adults (age ≥ 15 years) situated 30 km from Dhaka, the capital city. Mohammadpur is a locality within Dhaka. It has a slum that accommodates poor people and an affluent part inhabited by middle class people. The slum and a segment of the affluent area were inhabited by 1317 and 1259 adults, respectively, who were selected for study. All inhabitants aged ≥ 15 years of the selected clusters were included in the survey. Since poor people manage to live in thatched houses in rural or urban areas or as servants in the apartments of their employers, there was no true homeless person in these localities.

Preparation for the study. The months of July to December 2000 were used for appointing workers, setting up infrastructure, and for preparing questionnaires. During this phase, a census of the areas was carried out with identification of the houses with a COPCORD registration number. Two COPCORD clinics were set up, one each in the rural and urban areas. Several meetings were held between the COPCORD study group and community leaders, imams, and teachers explaining the aims and objectives of the study. Their suggestions were accepted where appropriate.

Preparation of the questionnaire. The survey instrument was the COPCORD Core Questionnaire that had been validated and used in surveys in the Asia-Pacific region[6,12]. It has 2 parts: part one is used by nonmedical field workers and part two is a structured history and examination sheet (COPCORD Examination Sheet) designed to be used by trained doctors. The former is aimed at detection of respondents with musculoskeletal (MSK) pain (positive respondents) with some elaboration of the complaints and questions on help-seeking behavior and functional disability. The English version of the first part of the questionnaire was translated to Bengali. An English language expert with no prior knowledge of the instrument then translated it back into English. A few modifications were done through joint consultation among the researchers and translators to suit the Bangladeshi application. The original English version of the COPCORD Examination Sheet was used without translation. Fibromyalgia (FM) tender points were incorporated in the questionnaire.

Training procedures. Ten university graduates were appointed as interviewers. They were trained and evaluated on administering the Bengali version of the questionnaire. Five certified internists were trained in using the COPCORD Examination Sheet by repeated clinical discussion sessions and on obtaining relevant clinical data and making appropriate rheumatological diagnoses.

Data collection. The interviewers interviewed all inhabitants ≥ 15 years of age in each house. The internists examined the positive respondents. To serve as controls, 100 randomly selected rural and 136 urban negative respondents were examined. A team of rheumatologists visited the area once a week. They reviewed the questionnaires and the examination sheets of all respondents and evaluated respondents when diagnostic difficulties arose. Data collection continued from January 1 to February 28, 2001.

Definitions of terms. 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 labeled 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. "Work loss" was defined as the duration of temporary cessation of work due to MSK pain within the preceding year. Internationally accepted criteria (e.g., American College of Rheumatology criteria) were followed for conditions for which they were available, e.g., for rheumatoid arthritis (RA), FM, ankylosing spondylitis, gout, etc. For conditions for which there are no internationally accepted criteria, the guidelines in the appendix of the COPCORD Examination Sheet were adopted. The clinical judgment of the investigators was relied on for conditions for which there are neither internationally accepted criteria nor any guideline in the COPCORD instrument.

Data analysis. The data were coded using the EpiInfo statistical package and transferred to SPSS-PC+, version 10, for analysis. The prevalences of overall MSK pain and various rheumatic diseases were estimated with exact binomial 95% confidence intervals. In each phase, prevalence was estimated using the number of respondents of that phase as the denominator, excluding the missing subjects. The chi-square test was used for the difference between proportions.

RESULTS

Sociodemographic data. Totals of 2601 (98.7%), 1307 (99.2%), and 1252 (99.4%) respondents were available for interview in the rural, urban slum, and urban affluent communities, respectively. Respondents' sociodemographic data in the 3 communities are shown in Table 1.

Prevalence of MSK pain. The overall point prevalence of MSK pain was 26.3% (95% CI 25.0–27.4). Total numbers of positive respondents were 681 (women 404, men 277), 325 (women 165, men 160), and 349 (women 244, men 105), respectively, in rural, urban slum, and affluent communities. The prevalence estimates were 26.2%, 24.9%, and 27.9%, respectively. Prevalence was 31.3% in women and 21.1% in men and in the rural area. The estimates were almost similar in the urban slum and affluent communities (Table 2). Estimates increased with advancing age. Prevalence estimates were higher in women in all 3 communities and almost in all age groups. Notable exceptions were for the age groups 15 to 24 and ≥ 55 years in urban slum respondents, in which the prevalence was higher in men. The prevalence in urban affluent women was higher than that in rural and slum women. Similarly, the prevalence was higher in slum men than in rural and urban affluent men (Table 2).

In the rural area, the prevalence of MSK pain was higher in housewives, followed by cultivators, weavers, and laborers. In the urban area it was highest in laborers engaged in earth-digging and carrying, followed by domestic workers and housewives (Table 3).

In all 3 communities, the low back was the site most commonly affected, followed by knees, neck, and shoulders. The prevalence of hip pain was particularly higher in rural communities (Table 4).

Disability and work loss. Functional disability of any degree in one or more of the 10 day to day activities was reported by 664, 305, and 310 positive respondents in the rural, urban slum, and affluent communities. Thus the point prevalence of disability due to MSK pain in the community was 25.5%, 23.3%, and 24.8%, respectively. Seventy (2.7%), 37 (2.8%), and 32 (2.6%) respondents in the rural, urban slum, and

Table 1. Sociodemographic data of the respondents.

	Rural	Urban Slum	Urban Affluent
Age, yrs, mean ± SD	32.8 ± 15.6	30.7 ± 12.4	32.3 ± 14.6
F/M	1290/1311	600/707	688/564
Education, %			
Illiterate	42.1	44.2	7.3
Read and sign	14.6	30.1	5.9
Primary education	22.3	14.5	6.3
Secondary education	20	10.6	35.8
Graduation	1.1	0.6	44.6
Occupation, %			
Housewife	39	26.1	24
Laborer	13.5	9.9	0
Factory worker	—	6	0.16
Rickshaw puller	—	22.5	0.08
Weaver	8.7	—	—
Service holder	7.3	2.7	22.2
Business professional	11	5.1	9.8
Student	7	0.9	23.8
Domestic worker	—	4.3	10.9
Cultivator	4.5	—	—

Table 2. Prevalence of musculoskeletal pain in different age groups. Confidence intervals in parentheses.

Age Group, yrs	Rural			Urban Slum			Urban Affluent		
	Men, n = 1311	Women, n = 1290	Total, n = 2601	Men, n = 707	Women, n = 600	Total, n = 1307	Men, n = 564	Women, n = 688	Total, n = 1252
15–24	8.1 (6.7–9.7)	9.2 (7.7–10.9)	8.7 (7.0–10.7)	16.3 (13.7–19.3)	13.8 (11.2–16.9)	15.0 (11.9–18.8)	6.6 (4.8–9.1)	20.5 (17.5–24.0)	15.0 (11.8–18.9)
25–34	14.3 (12.5–16.3)	26.4 (24.1–28.9)	19.9 (16.8–23.3)	20.7 (17.8–23.9)	29.5 (25.9–33.4)	24.7 (20.8–29.1)	11.6 (9.1–14.6)	30.9 (27.2–34.8)	22.3 (18.1–27.1)
35–44	25.8 (23.5–28.3)	49.4 (46.7–52.1)	37.1 (32.4–41.9)	20.4 (17.5–23.6)	46.0 (42.0–50.1)	30.3 (24.5–36.7)	22.8 (19.4–26.5)	51.4 (47.3–55.5)	38.4 (31.8–45.5)
45–54	32.8 (30.3–35.4)	58.4 (55.7–61.1)	45.6 (39.5–51.9)	30.6 (27.3–34.2)	37.8 (33.9–41.8)	33.3 (25.1–42.7)	32.9 (29.1–37.0)	52.7 (48.6–56.8)	43.2 (35.8–50.9)
55–64	48.35 (45.7–51.1)	65.5 (62.8–68.1)	56.7 (49.1–64.1)	55.1 (51.3–58.8)	52.4 (48.3–56.5)	54.0 (39.5–67.9)	44.0 (39.9–48.2)	63.2 (59.1–67.1)	49.3 (37.2–61.5)
65+	62.0 (59.3–64.6)	68.9 (66.3–71.4)	65.4 (57.2–72.7)	60.0 (56.3–63.6)	38.5 (34.6–42.5)	50.0 (31.1–68.9)	31.2 (27.4–35.2)	72.7 (68.9–76.2)	55.3 (38.5–71.1)
Total	21.1 (18.9–23.4)	31.3 (28.9–33.9)	26.2 (24.5–27.9)	22.6 (19.6–25.9)	27.5 (24.0–31.3)	24.9 (22.6–27.3)	18.6 (15.5–22.1)	41.5 (37.5–45.6)	27.9 (25.4–30.5)

Table 3. Prevalence of musculoskeletal pain by occupation.

Occupation	Rural, n = 2601			Urban Slum, n = 1307			Urban Affluent, n = 1252		
	Interviewed Population	Positive Respondents	Prevalence, %	Interviewed Population	Positive Respondents	Prevalence, %	Interviewed Population	Positive Respondents	Prevalence, %
Housewife	1009	342	33.8	341	69	20.2	300	123	41.0
Cultivator	118	38	32.2	—	—	—	—	—	—
Weaver	227	50	22.0	—	—	—	—	—	—
Laborer	350	65	18.5	123	57	46.3	—	—	—
Business professional	285	57	18.2	67	19	28.3	123	37	30.1
Service holder	190	20	10.5	35	4	11.4	278	58	20.9
Student	181	13	7.1	12	1	8.3	298	39	13.1
Rickshaw puller	—	—	—	295	79	26.8	—	—	—
Domestic worker	—	—	—	56	21	37.5	137	47	34.3
Garment worker	—	—	—	81	17	20.9	—	—	—
Other	241	96	39.8	297	54	18.2	116	40	34.5

Table 4. Prevalence (%) of musculoskeletal pain by site.

Pain Location	Rural, n = 2601	Urban Slum, n = 1307	Urban Affluent, n = 1252
Low back	20.1 (18.6–21.7)	18.1 (16.1–20.3)	18.4 (16.3–20.7)
Knee	14.0 (12.7–15.4)	14.2 (12.4–16.2)	15.8 (13.9–18.0)
Hip	13.0 (11.7–14.4)	5.9 (4.7–7.4)	7.0 (5.7–8.6)
Shoulder	11.5 (10.3–12.8)	7.3 (6.0 –8.9)	9.3 (7.8–11.10)
Neck	10.8 (9.7–12.1)	8.3 (6.9–10.0)	10.2 (8.6–12.0)
Heel	7.7 (6.7–8.8)	5.9 (4.7–7.4)	6.6 (5.3–8.2)
Elbow	6.7 (5.8–7.8)	6.9 (5.6–8.5)	6.2 (5.0–7.7)
Wrist	6.0 (5.1–7.0)	6.8 (5.5–8.3)	6.9 (5.6–8.5)
Hand	5.8 (5.0–6.8)	5.7 (4.5–7.1)	6.4 (5.1–7.9)
Foot	5.1 (4.3–6.0)	3.9 (3.0–5.1)	3.3 (2.4–4.5)
Other	2.6 (2.0–3.3)	7.6 (6.3–9.2)	7.2 (5.9–8.8)

Figures in parentheses are 95% CI.

affluent communities, respectively, reported complete inability in performing at least one of these functions. Lifting and bending were the functions most commonly affected in both rural and urban communities (Table 5). Work loss was reported by 572 (22%), 680 (52%), and 276 (22%) respondents in the 3 areas. The durations of work loss in the affected respondents were 49.3 ± 47.5, 50.8 ± 103.3, and 29.3 ± 56.5 days, respectively.

Prevalence of rheumatic disorders. Groups of 648, 297, and 327 respondents were finally available for clinical evaluation by doctors in the rural, urban slum, and affluent communities. The denominator decreased to 2568, 1279, and 1230, respectively. Eventually, 638 (382 women, 256 men), 289 (151 women, 138 men), and 310 (224 women, 91 men) respondents were found to have some rheumatic disorders. Thus, the prevalence estimate of rheumatic disorders was 24.8%, 22.6%, and 25.2%, respectively. Nonspecific low back pain, knee osteoarthritis (OA), and FM were the 3 top-ranking disorders in all communities (Table 6). Inflammatory arthropathies were uncommon. RA was detected in 15 women and 2 men in the rural, 5 women in the slum, and 2 women in the affluent community. One case of ankylosing spondylitis was detected in each community. Gout was diagnosed in only one woman, in the affluent subgroup.

DISCUSSION

This was the first study designed for estimation of prevalence of musculoskeletal pain and rheumatic disorders in Bangladeshi rural and urban communities.

The response rate was as high as in other COPCORD studies[5,7,9] and higher than that in non-COPCORD studies on prevalence of rheumatism in other communities[12-14]. This may be explained by a user-friendly design of the COPCORD questionnaire, which was able to identify most of the cases with MSK pain in the community. Door-to-door movement of interviewers and doctors has given effective coverage of the study population.

Prevalence estimates of MSK pain in rural communities have varied from 16.5% in Northern Pakistan[11] to 36.2% in Thailand[10]. In our study population, the rate was closer to those in rural Philippines[5] and Indonesia[7]. Prevalence estimates in 3 clusters, rural (26.2%), urban slum (24.9%), and urban affluent (27.9%), were nearly similar. In both different age groups and different communities, women suffered more frequently than their male counterparts. The estimates increased with age. Similar findings have also been observed in population studies in England[11] and India[8]. Remarkable similarity was observed in the prevalence for the age groups 25–65 years and older for men and woman in Philippines[5] and Indonesia[7].

Table 5. Difficulty in performing 10 specific activities among positive respondents.

Activity	Rural, % (n = 664)	Urban Slum, % (n = 305)	Urban Affluent, % (n = 310)
Lifting	92.2	93.1	93.9
Squatting	80.6	83.3	84.2
Bending	75.6	85.6	80.3
Use of stairs	78.1	73.8	75.2
Get into and out of vehicle	75.3	75.7	68.1
Get in and out of bed	63.8	72.2	59.7
Walking	31.2	47.5	42.9
Bathing	44.4	19.7	16.5
Dressing	39.0	14.7	12.3
Lift glass to mouth	12.3	8.5	6.1

Table 6. Prevalence rates of rheumatic disorders. Confidence intervals in parentheses.

	Rural, n = 2568			Urban Slum, n = 1279			Urban Affluent, n = 1230		
	Men, n = 1295	Women, n = 1273	Total, n = 2568	Men, n = 692	Women, n = 587	Total, n = 1279	Men, n = 555	Women, n = 675	Total, n = 1230
Knee osteoarthritis	6.4 (5.2–7.9)	8.5 (7.1–10.2)	7.5 (6.5–8.6)	10.4 (8.3–13.0)	7.8 (5.8–10.4)	9.2 (7.7–11.0)	6.3 (4.5–8.7)	15.9 (13.3–18.9)	10.6 (9.8–13.5)
Nonspecific low back pain	5.9 (4.7–7.4)	7.2 (7.1–10.2)	6.6 (5.7–7.7)	10.4 (8.3–13.0)	9.4 (7.2–12.1)	9.9 (8.4–11.7)	6.8 (4.9–9.3)	11.1 (8.9–13.8)	9.2 (7.7–11.0)
Lumbar spondylosis	4.5 (3.5–5.8)	5.5 (4.3–6.9)	5.0 (4.2–5.9)	2.2 (1.3–3.7)	1.7 (0.9–3.2)	2.0 (1.3–2.9)	1.3 (0.6–2.8)	3.1 (2.0–4.8)	2.3 (1.6–3.3)
Fibromyalgia	1.2 (0.7–2.0)	7.5 (6.1–9.1)	4.4 (3.7–5.3)	1.4 (0.7–2.7)	5.3 (3.7–7.5)	3.2 (2.3–4.4)	0.2 (0.0–1.2)	5.8 (4.1–7.9)	3.3 (2.4–4.4)
Cervical spondylosis	2.4 (1.7–3.4)	2.8 (2.0–3.9)	2.6 (2.0–3.3)	1.4 (0.7–2.7)	1.2 (0.5–2.6)	1.3 (0.8–2.2)	1.4 (0.6–2.9)	3.0 (1.9–4.7)	2.3 (1.6–4.4)
Soft tissue rheumatism	2.4 (1.7–3.4)	3.1 (2.3–4.3)	2.7 (2.2–3.5)	2.5 (1.5–4.0)	2.6 (1.5–4.3)	2.5 (1.8–3.6)	2.5 (1.4–4.3)	3.9 (2.6–5.7)	3.3 (2.4–4.4)
Frozen shoulder	0.6 (0.3–1.2)	1.6 (1.0–2.5)	1.1 (0.8–1.6)	0.7 (0.3– 1.8)	0.3 (0.0–1.3)	0.5 (0.2–1.2)	0.5 (0.1–1.7)	1.5 (0.8–2.8)	1.1 (0.6–1.9)
Rheumatoid arthritis	0.2 (0.1–0.7)	1.2 (0.7–2.0)	0.7 (0.4–1.1)	0	0.9 (0.3–2.2)	0.4 (0.1–1.0)	0	0.3 (0.1–1.2)	0.2 (0.0–0.7)
Other noninflammatory	2.7 (1.9–3.8)	5.7 (4.5–7.2)	4.2 (3.4–5.0)	4.8 (3.9–6.9)	9.4 (7.2–12.1)	7.9 (6.5–9.6)	5.4 (3.7–7.7)	9.8 (7.7–12.4)	7.8 (6.4–9.5)
Other inflammatory	0.1 (0.0–0.5)	0.1 (0.0–0.5)	0.1 (0.0–0.4)	0.1 (0.0–0.9)	0.1 (0.0–0.9)	0.1 (0.0–0.6)	0.1 (0.0–1.0)	0.1 (0.0–1.0)	0.2 (0.0–0.7)

By occupation, MSK pain was most common in housewives, cultivators, and weavers. Low back pain had highest prevalence, followed by OA of knees, in our study population. The role of occupations, for example, in repetitive strain or overuse, in the etiopathogenesis of low back pain and OA is a subject for future studies. Trauma, lack of education, and primitive work environments are the other risk factors we may identify from the survey. In industrialized countries, workers in certain occupations have been found to be at increased risk of low back and knee pain[15-19]. The observed higher prevalence of MSK pain in men in slums and affluent women remains to be investigated.

In our study, the prevalence of functional disability (mild difficulty to total inability) was 24% in both rural and urban communities. In the Filipino rural community, the disability rate was found to be 5%[5] and in the urban population it was 25%[9]. Disability rates were 2.8% and 0.9%, respectively, in the Indonesian rural and urban communities[7]. Differences in the prevalence of disability among COPCORD studies most likely result from use of different definitions of disability. We had defined disability as any degree of limitation in performing any of the 10 predetermined activities. In other studies, disability was defined as total inability to perform these common activities. The prevalence of total disability in our study was similar to those in rural Indonesia[7] and Thailand[10].

A striking finding in our study was a high prevalence of FM. The estimate was similar in the Pakistani study[11], but lower in other COPCORD studies. Inclusion of tender points in the COPCORD Examination Sheet and definition of FM as a distinct category might have increased the prevalence in our population. The prevalence of RA was higher in this study compared to that in COPCORD studies in rural Philippines[5], India[20], and other rural population studies[21,22]. This may partly be explained by our use of more educated interviewers who could identify respondents with milder pain, and of specially trained internists who were capable of diagnosing cases with milder, atypical, and partly suppressed disease. The prevalence was even higher in the series from Northern Pakistan[11]. Prevalence of gout in our population was less than that reported by the COPCORD study in rural Indonesia[7]. Of note, in a Chinese rural population[23] and an Indian survey[24], no single case of gout was detected.

In summary, it may be stated that the clinical and socioeconomic burden of rheumatic disorders is as high in Bangladeshi rural and urban communities as in populations in other countries. Women are affected more frequently than men. Poor working conditions involving heavy manual labor and occupational injuries probably contribute to the high prevalence in men living in slum communities. Proper identification of risk factors and development and field-testing of interventional strategies should be the priority subjects for future COPCORD studies.

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