

# WHO-ILAR COPCORD study (stage 1, urban study) in Sanandaj, Iran

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**Abstract** This study aims to conduct an urban Community Oriented Program for Control Of Rheumatic Diseases (COPCORD) study in Sanandaj (Kurdistan, Iran). Sanandaj with a population of 311,446 (2006 census), Caucasian of Kurdish subgroup, was selected as the field. Sanandaj was divided into 100 clusters and subjects were randomly selected from them (50 subjects from each cluster). The COPCORD study started on July 2011 and ended on June 2012. Of the households, 1,631 was visited and 5,830 persons were interviewed. The male to female ratio was 0.8–1 (44.5 % males, 55.5 % females). Musculoskeletal complaints during the past 7 days were detected in 42.8 % of the interviewed subjects (36.3 % males, 48.1 % females). The distribution was 16.7 % shoulder, 10 % wrist, 9.7 % hands and fingers, 7.7 % hip,

26.3 % knee, 9.9 % ankle, 6.4 % toes, 9.5 % cervical spine, and 21.5 % dorsal and lumbar spine. Degenerative joint diseases were detected in 19.4 % of the subjects: 1.8 % neck, 18.9 % knee, 3.9 % hands, and 0.51 % hip. Low back pain was detected in 16.5 %, sciatica in 1.2 %, cervical nerve root pain in 0.24 %, and soft tissue rheumatism in 5.5 %. Inflammatory disorders were 0.51 % rheumatoid arthritis, 0.22 % seronegative spondyloarthropathy, 0.10 % ankylosing spondylitis, 0.05 % systemic lupus erythematosus, and 0.10 % Behcet's disease. Fibromyalgia was detected in 0.62 % and gout in 0.12 % of the studied population. Disability was reported by 28.3 %. It was present at the study time in 21.4 %. Comparing the four COPCORD studies of Iran, the figures (numbers) obtained by COPCORD Sanandaj are much the same as the COPCORD study in Tehran. Joint complaints were seen less frequently than in the COPCORD urban study of Zahedan and rural study of Tuyserkan. Osteoarthritis was higher than in Tehran, but the same as the two others. Soft tissue rheumatism was rather the same. Rheumatoid arthritis was higher than Tehran and Tuyserkan, but lower than Zahedan.

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## Introduction

The Community Oriented Program for Control Of Rheumatic Diseases, the COPCORD, was created in 1983 by the World Health Organization and the International League of Association for Rheumatology. The program was created for recognition, prevention, and the control of rheumatic disorders in the developing countries. Near two third world's population are living in these countries. COPCORD has three stages: (1) prevalence of rheumatic disorders and identification of risk

factors; (2) education of primary health-care physicians, paramedical professionals, and the community; and (3) improved health care and environmental etiologic research of the rheumatic disease. More details can be seen on the world COPCORD website ([www.copcord.org](http://www.copcord.org)).

Nineteen countries participated in the COPCORD program. The first study was published in 1985 and the last in 2013. Alphabetically, they were Australia [1, 2]; Bangladesh [3–5]; Brazil [6]; Brazil, Chile and Mexico [7]; China [8–12]; Cuba [13]; India [14–17]; Indonesia [18–21]; Iran [5, 22–29]; Kuwait [30]; Lebanon [31]; Malaysia [32]; Mexico [33–37]; Pakistan [38]; Philippines [39–41]; Thailand [42]; and Vietnam [43].

Iran is situated in the middle of the Silk Road and was long known to be the crossroad between east and west. Iran has two main ethnic groups, the Caucasians (the most numerous; 75.4 %) and the Turks (22 %; from East Asian origin). Iran has a minority of Semites too [25]. The Caucasians are subdivided in Fars, Kurd, Lor, Belouch, and Armen (Armenians). The Turks are divided into two subgroups, Turk and Turkoman. The third ethnic group is Semites, forming 2.6 % of the population. They are subdivided into Arabs, Jews, and Assyrians. Each part of Iran contains mainly one of the two major ethnic groups, Caucasians or Turks.

Two urban studies were performed in Iran. The first was in Tehran, the capital of Iran, situated in the north center of Iran. The ethnic distribution of Tehran is very close to the ethnic distribution of Iran, having both the same percentage of different ethnicities. The study was done with 10,000 participants [25]. The second was in Zahedan, situated in the southeastern part of Iran. The study was done with 2,100 participants, almost exclusively Caucasians [29]. The present study is the third urban study in Iran, done in Sanadaj, situated in the northwestern part of Iran with the Kurd population, a subgroup of Caucasians of Iran. A fourth urban study is under its way with the Zoroastrian people of Yazd (situated in the central part of Iran). They are of pure Caucasian ethnicity and never been mixed with other Caucasian subgroups or other ethnicities. This project will be finished in 2014. In 2008, a rural study was performed in Iran with five villages of Tuyserkar city, in the northwestern part of Iran, with 1,565 participants, all again of Caucasian ethnicity [26]. The location of the completed COPCORD studies is shown on the map of Iran (Fig. 1).

## Materials and methods

For better understanding of the data and easier comparison with the first urban study of Iran, which was done in Tehran, the same report frame was chosen.

*The field* The city of Sanandaj was selected for this COPCORD study. It is the capital of Kurdistan province and is situated in the northwestern part of Iran. The population is 311,446 in 81,380 households. The ethnicity is Kurdish, a subgroup of the Caucasians. The rationale of this study was that such a study has never been done in this subgroup of Caucasians.

*Goal* The goal of the study was to interview 5,000 persons. The time period for the project was set for 1 year.

*Sampling plan* The city of Sanandaj is divided into 19 health districts. We selected 100 clusters randomly from them.

*Questionnaire* COPCORD Core Questionnaire (CCQ) was used to screen subjects for musculoskeletal complaints. The original CCQ comprised seven main sections: background information (A), work history (B), pain/tenderness/swelling/stiffness during the last week (c1) and past (C2), functional disability (D), difficulty in performing specific tasks (E), treatment (F), and evaluation (G). In that study, we added another section (H) for extra-articular symptoms of some rheumatic diseases (aphthous ulcers, blurred vision, etc.), like Behcet's disease, which had a high prevalence in Iran [24, 25].

We used for, this study, the same COPCORD questionnaire as for the Tehran COPCORD study, which was validated before [25]. Sections A, B, C1, D, G, and H of the final questionnaire were administered to all individuals exactly the same way as it was for the Tehran study [25].

*Training of field data collectors* Physical examination was done by one of us, NM. Interviewers were chosen from certified nurses. Blood sampling was done by a lab technician.

For interviewers, training workshops (four sessions) were organized. Twelve nurses participated, and eight of them were selected. They were divided into four teams of interviewers, each team having one male and one female nurse.

*Data collection* Two days each week, the selected cluster was visited by the team (project manager, interviewers, the rheumatologist, and the lab technician). The identified household was visited and all explanation about the procedure was given. Then, the folders forms for each family were completed. In this form, the identification information of persons of 15 years and above of each household was recorded. Interviewers then interviewed the eligible persons of the household. They went back to the same household for two consecutive days to collect data from those who were absent the previous day. In each cluster, 58 persons were interviewed, except one cluster with 88 persons.

Every interviewer started data collection by introducing him/herself and showing his/her identity card, and then went on applying the CCQ. After completing the CCQs of each family, questionnaires were submitted to the team head. The head would check the CCQ, and if there was a positive case



Fig. 1 COPCORD sites in Iran

that needed physical examination, he/she was selected for the rheumatology examination by the rheumatologist.

If lab tests were necessary, the examined person was introduced to the lab technicians, and the blood samples were taken at the same session. In case that X-rays were necessary, they were sent to the nearest radiology center in each field.

#### Quality control and monitoring

All the interviewers received regular quality control visits from the project manager. All of the family folder forms, CCQs, and examination sheets were checked by the team head in the field. All of the questionnaires were checked again during the enumeration process and were reviewed for any missing data or mistakes. They were rectified either by the interviewer himself/herself or by telephone contact.

**Ethical issues** The study proposal was approved by the Ethical Committee of the Sanandaj University of Medical Sciences. It was previously approved by the National Ethics Committee on Medical Research of the Ministry of Health and Medical Education. All subjects were informed about the

study goal and methodology, and voluntarily participated in the study. They were enrolled in the study after having signed their informed consent. Participants could withdraw from the study at any stage (interview, physical exam, and paraclinical tests). All of the paraclinical costs were paid by the project budget. All subjects who had physical examination were sent a brief report about their health status. Lab results and X-rays were also sent to the subjects.

**Data entry and data analysis** Five percent of the data, at the end of each day of data entry, were checked for quality control.

Descriptive data were analyzed by survey data analysis methods with regard to age, sex, and weight of the cluster (based on 1,385 census of population and housing). If the disease prevalence was less than 20 cases, the Poisson regression for survey data was used. The STATA program (version 8) was used for all analysis.

**Pilot study** A pilot study of 50 subjects was undertaken to assess the feasibility of the project.

**Final analysis** As the male/female ratio of the interviewed subjects was slightly different from those of the last Sanandaj



census (2006); the calculated data were adjusted according to it as it was for COPCORD Tehran [25].

## Result

**Study period** The data collection of COPCORD study started on July 2011. It took 11 months and ended on June 2012.

**General data** At the end of the study, 1,631 households were visited and 5,830 subjects were interviewed. Among them, 2,496 (42.8 %) needed a physical examination by a rheumatologist, 1,171 (20.1) needed an X-ray procedure, and 416 (7.1 %) persons needed laboratory tests.

**Gender** The male/female ratio was 0.8:1 with 2,594 males (44.5 %) and 3,236 females (55.5 %). The 2008 Sanandaj census showed a male/female ratio of 1:1 with 50.0 % male and 50.0 % female.

**Ethnic distribution** The interviewed population was Caucasian of the Kurdish subgroup.

**Age distribution** Results are shown in Table 1. The proportion of age range was slightly different in the 2008 Sanandaj census (Table 1).

**Educational level** The percentage was 24.3 % for illiterate, 9.4 % for primary school, 12.4 % for secondary school, 28.5 % for college, 21.5 % for university, and 4 % for others.

**Musculoskeletal complaints during the past 7 days** Overall complaints were detected in 42.8 % of the interviewed subjects (41.9 % pain, 16.2 % swelling, and 28.9 % stiffness). The overall musculoskeletal complaints were more frequent in women (48 %) than in men (36.3 %). Table 2 shows the

percentage with their 95 % confidence interval (95 % CI) for all interviewed subjects and separately in males and females.

The joint distribution was 16.8 % shoulder (95 % CI, 14.2–19.4), 6.2 % elbow (95 % CI, 4.5–7.9), 10 % wrist (95 % CI, 7.3–12.6), 9.7 % hand (95 % CI, 7.8–11.6), 7.7 % hip (95 % CI, 5.8–9.5), 26.3 % knee (95 % CI, 24.3–28.3), 9.9 % ankle (95 % CI, 7.3–12.5), 6.4 % toes (95 % CI, 5.3–7.6), 9.5 % cervical spine (95 % CI, 6.3–12.7), and 21.5 % dorsolumbar spine (95 % CI, 19.2–23.7).

**Diagnosed diseases** Degenerative joint diseases (osteoarthritis) were found in 19.4 % of interviewed persons (95 % CI, 15.2–23.6). Neck osteoarthritis (OA) was discovered in 1.8 % (95 % CI, 0.7–2.9), 18.8 % knee (95 % CI, 16.3–21.4), 3.9 % hands (95 % CI, 2.1–4.4), and 0.5 % hip OA (95 % CI, 0.2–0.8). Details are given in Table 3.

Other mechanical disorders (Table 4) were 2.7 % chondromalacia patellae (95 % CI, 1.1–4.4), 16.5 % low back pain (95 % CI, 14.4–18.6), 1.2 % sciatica (95 % CI, 0.4–2.0), 0.14 % de Quervain tenosynovitis (95 % CI, 0.05–0.51), 0.39 % trigger finger (95 % CI, 0.08–0.97), 1.5 % carpal tunnel syndrome (95 % CI, 0.4–2.5), 0.7 % tennis elbow (95 % CI, 0.1–1.2), 0.39 % golf elbow (95 % CI, 0.07–0.81), and 1.0 % frozen shoulder (95 % CI, 0.1–1.8). All periartthritis (tendonitis, tenosynovitis, and bursitis) were detected in 5.5 % (95 % CI, 4.2–6.7) of the population (Table 3).

Inflammatory disorders (Table 4) were 0.51 % rheumatoid arthritis (95 % CI, 0.12–0.89), 0.22 % seronegative spondyloarthropathy (95 % CI, 0.08–0.82), 0.10 % ankylosing spondylitis (95 % CI, 0.02–0.42), 0.05 % systemic lupus erythematosus (95 % CI, 0.08–0.66), and 0.10 % Behcet's disease (95 % CI, 0.05–0.29). Fibromyalgia was detected in 0.6 % (95 % CI, 0.1–1.3) and gout in 0.12 % (95 % CI, 0.01–0.57) of the studied population (Table 3).

Disability from mild (minimal difficulty to perform some tasks) to severe forms were reported by 1,650 (28.3 %; 95 % CI, 27.2–29.5) of interviewed persons (Table 4). Females

**Table 1** Age distribution

Age	All				Male				Female			
	Number	%	95 % CI	Census (%)	Number	%	95 % CI	Census (%)	Number	%	95 % CI	Census (%)
15–29	2,362	40.5	39.2–41.8	44.1	1,116	43.0	41.1–44.9	43.6 %	1,246	38.5	36.8–40.2	44.6
30–39	1,296	22.2	21.1–23.3	23.8	590	22.7	21.1–24.4	23.8 %	706	21.8	20.4–23.2	23.9
40–49	1,028	17.7	16.7–18.7	15.7	430	16.6	21.1–24.4	15.8	598	18.5	17.2–19.9	15.7
50–59	596	10.2	9.5–11.0	9.7	230	8.9	7.9–10.1	9.8	366	11.3	10.3–12.5	9.5
60–69	346	5.9	5.3–6.5	4.2	137	5.3	4.5–6.2	4.4	209	6.5	5.7–7.4	3.9
≥70	202	3.5	3.1–4.0	2.5	91	3.5	2.9–4.3	2.6	111	3.4	2.8–4.1	2.4
Total	5,830	100	–	100	2,594	100	–	100	3,236	100	–	100

95 % CI 95 % confidence interval; census 2006 Sanandaj

**Table 2** Musculoskeletal complaints (overall), pain, swelling, and stiffness, during the past 7 days

Age	Overall complaints		Pain		Swelling		Stiffness	
	%	95 % CI	%	95 % CI	%	95 % CI	%	95 % CI
15–29	26.9	22.3–31.6	26.3	24.2–28.9	6.4	5.7–7.1	14.3	13.2–15.5
30–39	44.7	41.3–47.5	44.2	41.5–46.9	12.9	10.7–15.4	29.7	26.1–33.4
40–49	50.4	46.1–54.6	49.5	46.1–52.8	19.7	17.2–22.2	35.6	32.3–38.8
50–59	58.5	55.6–61.5	57.4	52.1–62.7	29.5	26.8–32.3	44.1	40.1–48.3
60–69	71.7	67.5–75.9	69.9	65.3–74.7	41.9	37.3–46.6	60.7	55.7–65.8
≥70	81.7	77.0–86.3	79.2	75.6–83.3	52.9	48.5–57.3	63.4	59.3–67.7
All	42.8	39.2–46.4	41.9	39.8–44.1	16.2	14.8–17.5	28.9	26.3–31.5

95 % CI 95 % confidence interval

complained of more disability than men. In females, it was 33.9 % (95 % CI, 32.3–35.5), while in males it was 24.2 % (95 % CI, 22.6–25.9). At the time of interview, disability was

present in 21.4 % (95 % CI, 20.4–22.5), 27.3 % women (95 % CI, 25.8–28.8) and 16.9 % men (95 % CI, 15.5–18.4). Disability was found in the past history, but not present at

**Table 3** Musculoskeletal diseases by percentage and 95 % confidence interval (95 % CI) in Iran

	Sanandaj		Tehran [25]		Tuyserkhan [26]		Zahedan [29]	
	%	95 % CI	%	95 % CI	%	95 % CI	%	95 % CI
Musculoskeletal complaints (past 7 days)	42.8 %	41.5–44.1	41.9	39.5–44.3	66.6	64.2–68.9	54.1	52.0–56.2
Osteoarthritis								
• Total	19.4	15.2–23.6	16.6	15.3–17.8	20.5	17.3–23.7	20.7	17.9–23.5
• Knee	18.8	16.3–21.4	15.3	14.1–16.4	19.3	16.2–22.5	17.0	14.6–19.4
• Hand	3.9	2.1–4.4	2.9	2.3–3.4	2.7	0.3–5.0	2.3	1.4–3.1
• Neck	1.8	0.7–2.9	1.7	1.4–2.1	2.2	0.7–3.8	3.8	2.5–5.1
• Hip	0.5	0.2–0.8	0.32	0.21–0.44	0.13	0.01–1.33	0.33	0.11–0.55
Other mechanical								
• Chondromalacia patella	2.7	1.1–4.4	3.7	3.1–4.3	0.65	0.15–2.79	0.66	0.27–1.05
• Cervical discopathy	0.24	0.05–0.9	–	–	–	–	1.4	1.0–1.8
• Low back pain	16.5	14.4–18.6	15.4	14.4–16.5	23.4	17.8–28.9	19.0	15.3–22.7
• Sciatica	1.2	0.4–2.0	0.9	0.63–1.10	0.06	0.006–0.67	1.7	0.9–2.5
• Carpal tunnel syndrome	1.5	0.4–2.5	1.3	1.0–1.5	0.65	0.15–2.79	1.9	1.4–2.5
• Periarthritis (all)	5.5	4.2–6.7	4.6	3.9–5.4	2.2	0.8–3.6	4.8	3.3–6.2
• Rotator cuff rupture	0.051	0.01–0.16	–	–	–	–	1.5	0.8–2.2
• Frozen shoulder	1.0	0.1–1.8	0.54	0.39–0.72	1.04	0.6–1.4	0.47	0.17–0.78
• Tennis elbow	0.7	0.1–1.2	1.2	0.9–1.5	0.97	0.01–1.93	1.0	0.6–1.4
• Golf elbow	0.39	0.07–0.81	0.51	0.35–0.71	0.26	0.02–2.67	0.09	0.02–0.37
• de Quervain Tenosynovitis	0.14	0.05–0.51	0.23	0.15–0.32	0.13	0.01–1.33	0.42	0.16–0.69
• Trigger finger	0.39	0.08–0.97	0.21	0.13–0.32	0.06	0.006–0.67	0.04	0.006–0.33
Inflammatory diseases								
• Rheumatoid arthritis	0.51	0.12–0.89	0.33	0.22–0.46	0.19	0.05–0.34	1.0	0.65–1.34
• Spondyloarthropathy	0.22	0.08–0.82	0.23	0.16–0.35	1.10	0.3–4.2	0.23	0.62–0.09
• Ankylosing spondylitis	0.10	0.02–0.42	0.12	0.06–0.21	–	–	–	–
• Systemic lupus erythematosus	0.05	0.08–0.66	0.04	0.01–0.10	0.06	0.006–0.67	0.42	0.16–0.69
• All connective tissue diseases	0.08	0.06–0.72	–	–	–	–	–	–
• Behcet’s disease	0.10	0.05–0.29	0.08	0.04–0.16	–	–	0.23	0.08–0.63
Other diseases								
• Fibromyalgia	0.6	0.1–1.3	0.7	0.56–0.88	0.06	0.003–1.23	2.7	1.7–3.6
• Gout	0.12	0.01–0.57	0.13	0.07–0.22	–	–	0.09	0.02–0.37

**Table 4** Mild to severe disability in 1,650 persons who complained of disability at interview time, according to different activities

	Never		Mild		Moderate		Severe	
	%	95 % CI	%	95 % CI	%	95 % CI	%	95 % CI
Dressing	80.0	78.0–81.9	14.7	13.1–16.5	4.6	3.7–5.7	0.7	0.4–1.3
Getting up	60.9	58.5–63.2	22.8	20.8–24.9	15.3	13.6–17.1	1.0	0.6–1.6
Drinking	91.4	89.9–92.6	6.5	5.4–7.8	1.7	1.2–2.5	0.4	0.2–0.9
Eating	83.5	81.6–85.2	14.2	12.6–16.0	2.0	1.4–2.8	0.3	0.1–0.7
Walking	51.7	49.3–54.1	32.8	30.6–35.1	13.4	11.8–15.1	2.1	1.5–2.9
Bathing	63.5	61.2–65.8	25.0	22.9–27.1	10.4	9.0–12.0	1.0	0.6–1.6
Turkish toilet (squat toilet)	54.9	52.5–57.3	17.3	15.5–19.2	20.5	18.6–22.5	7.3	6.1–8.6
Taking an object on the floor	48.1	45.7–50.5	30.6	28.4–32.9	16.9	15.2–18.8	4.4	3.5–5.5
Hanging cloths on a rope	75.9	73.7–77.9	14.3	12.7–16.1	7.8	6.6–9.2	2.0	1.4–2.8
Going in and out a transport vehicle	50.1	47.7–52.5	32.5	30.3–34.8	13.9	12.3–15.6	3.5	2.7–4.5
Cross leg sitting	39.2	36.9–41.6	19.9	18.0–21.9	26.8	24.7–29.0	14.1	12.5–15.9
Opening boxes	73.0	70.8–75.1	15.9	14.2–17.7	7.1	5.9–8.4	4.0	3.1–5.1
Praying	41.0	38.6–43.4	23.4	21.4–25.5	25.6	23.5–27.7	10.0	8.6–11.5

the time of interview in 6.9 % (95 % CI, 6.3–7.6) of the interviewed persons, 6.6 % women (95 % CI, 5.8–7.5), and 7.3 % men (95 % CI, 6.3–8.4).

## Discussion

The COPCORD Sanadaj is an urban study from the northwestern part of Iran in a population of Kurdish origin (subgroup of Caucasians). To our knowledge, this is the first COPCORD study done in the Kurdish population. Comparison of the

male/female ratio of the COPCORD study and from the 2006 census of Sanandaj shows a slight difference between them. The same was found in the age distribution. The COPCORD data were adjusted accordingly.

The musculoskeletal complaints during the past 7 days were approximately the same in Sanadaj and Tehran COPCORD urban studies ( $p=0.27$  by Pearson's chi-square test). It was higher in the Zahedan urban study and the Tuyserkar rural study with  $p<0.001$  (Table 3). The difference between Zahedan and the two other urban studies is also significant ( $p<0.001$ ). It is interesting to note that Tehran with a mixed population, comprising Caucasians of the different

**Table 5** Recent COPCORD urban studies in APLAR region (Asia and Pacific area)

	No.	Pain	LBP	Neck pain	Knee pain	OA	STR	FM	RA	SPA	CTD	Gout
Australia aboriginal	847	33	12.5		11.2	5.5	7.4		0	0.5	0	4
Bangladesh urban slum	1,317	24.9	9.9			9.2	2.5	3.2				
Bangladesh urban affluent	1,259	27.9	9.2			10.6	3.3	3.3				
China—Shanghai	6,584		5.6	2.4	7		3.4		0.47	0.11	0.06	0.22
China—Chenghai	2,040		10.2	4.1	6.5							
India Pune	8,145	11.5	4.6		6.0	4.0	1.2		0.19	0.27		0.06
Iran (pilot study)	284	34.5	22.2	13.7	26.1	14.5	2.4					
Iran—Tehran (urban)	10,291	41.9	21.7	13.4	25.5	16.6	4.6	0.7	0.33	0.23		0.13
Iran—Zahedan (urban)	2,112	54.4	19.0	19.1	32.8	20.7	4.8	2.7	1.00	0.23		0.09
Iran—Sanandaj (urban)	5,830	42.8	21.5	9.5	26.3	19.4	5.5	0.6	0.51	0.22	0.08	0.12
Kuwait	7,670											
Malaysia	2,594	21.1	11.6	6.1					0.15	0.12		
Mexico	19,213	25.5				10.5			1.6	0.1		0.31
Vietnam	2,119		11.2		18.2	4.1	15.4		0.28		0.09	0.14

No. population interviewed, LBP low back pain, OA osteoarthritis, STR soft tissue rheumatism, FM fibromyalgia, RA rheumatoid arthritis, SPA seronegative spondylarthropathies, CTD connective tissue diseases

subgroups and other ethnicities like Turks and Semites, has the same musculoskeletal complaints with Sanadaj with pure Kurdish people. Therefore, if differences exist with the other COPCORD sites, it was probably due to other factors than ethnicity. Compared to other countries, the musculoskeletal complaint in this study (Sanandaj) was higher than in other countries (Table 5). The nearest was Australia [1] with 34 % (versus 42.8 %). The difference was significant ( $p < 0.001$ ). However, some differences may exist between COPCORD methods [44].

Osteoarthritis were seen more frequently in Sanadaj than in Tehran, but near the same in Zahedan and Tuysarkan studies. Periartthritis was the same in the three urban studies, two times more than in the rural study (Tuysarkan). Low back pain was the same as in Tehran, but lower than in the two other studies. Rheumatoid arthritis in Sanandaj was found to be a little higher than in Tehran and in Tuysarkan, but the difference was not significant. However, it was significant compared to Zahedan ( $p = 0.018$ ). The point prevalence of seronegative spondyloarthropathies was the same in the urban studies, but much lower than the rural study ( $p < 0.001$ ). Systemic lupus erythematosus was almost the same as in Tehran and Tuysarkan, but much lower than in Zahedan city ( $p < 0.001$ ). Behcet's disease seen with the same frequency as in Tehran, while much lower than in Zahedan, but the difference was not statistically significant. Fibromyalgia was seen as frequently as in Tehran, but much higher than in Tuysarkan ( $p = 0.002$ ) and much lower than Zahedan ( $p < 0.001$ ). Gout was seen as frequently as in Tehran and slightly higher in Zahedan, but the difference was not significant. The detail of all frequencies and their 95 % confidence interval is given in Table 4. The difference between the results of different COPCORD studies in Iran cannot be explained by a single factor. It must be multifactorial. The first explanation will be the ethnic difference between the studies. A previous study, on the data of the Tehran COPCORD study, showed that knee osteoarthritis were significantly more prevalent in the Turk population than Caucasians [27]. It was therefore expected that knee osteoarthritis be seen more frequently in Tehran (23.1 % Turks and 71.4 % Caucasians) than in the three other studies (all Caucasians). However, knee osteoarthritis were seen less frequently in Tehran than the three other sites. Other factors may have influenced, for example, older age (superior to 40 years) or more females in the three other sites, but they were near the same in all the sites. Lifestyle may be one of the reasons (more sedentary in Tehran), but that was not explored. There were other differences in some other musculoskeletal manifestations between some of the studies. No valuable reason can be found for them, they are probably multifactorial.

Low back pain (21.5 %) was the same as in Australia [22] and in Indonesia (urban study) [18]. It was much higher than in other countries, except in Beijing [12], China (35 %) where the difference was significant ( $p < 0.001$ ). Osteoarthritis were

seen with higher frequency (19.4 %) than in other countries (from 3.7 % in Pakistan [38] to 11.3 % in Thailand) [42]. Soft tissue rheumatism was seen less frequently (5.5 %) than in some countries (Vietnam, 15.4 % [43]; Australia aboriginal, 7.4 %) [2], but higher than the others, especially Thailand with 1.5 % [42]. Rheumatoid arthritis was approximately the same in near all countries of Asia and Pacific area, less than the classic 1 % of the population. In Mexico, the prevalence was 1.6 % [35]. Seronegative spondyloarthropathies was near the same in other countries, except higher in Australian aboriginals [2] and much lower in the Philippine urban study [41]. Fibromyalgia was seen lower than in Pakistan [38] and Bangladesh [3]. Gout was approximately the same in all countries, except in Australia (1.5 %) [1] and especially in Australian aboriginals (4 %) [2].

## Conclusion

Results of the urban study in Sanadaj are very similar to those of Tehran. Some differences appear between the results of Zahedan and the two other urban studies. Rheumatoid arthritis, Behcet's disease, and systemic lupus erythematosus were two to eight times more frequent in Zahedan than in Sanandaj and Tehran. However, looking at their confidence interval, the difference was not important.

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