

## ORIGINAL ARTICLE

# Prevalence of musculoskeletal disorders in southeastern Iran: a WHO-ILAR COPCORD study (stage 1, urban study)

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## Abstract

**Objective:** The purpose of this study was to determine the prevalence of musculoskeletal complaints and rheumatic diseases in southeast of Iran.

**Methods:** Subjects were selected based on a cluster sampling from 20 districts of urban areas in Zahedan, Iran. Subjects 15 years old and over were randomly selected and interviewed by trained interviewers in their houses. The Community Oriented Program for the Control of Rheumatic Disease (COPCORD) and Core Questionnaire (CCQ) were used in this study. The people with musculoskeletal complaints (pain, stiffness and swelling) were examined by the rheumatologist. Laboratory tests and radiographic exams were carried out when necessary to further categorize diagnoses.

**Results:** Data were collected from October 10, 2008 to September 15, 2009. Two thousand and one hundred subjects including 921 (43.9%) males and 1179 (56.1%) females were interviewed. The average age of the population was  $33.1 \pm 14.7$  years. The prevalence of complaints within the past 7 days prior to the interview was 54.13%. The most common sites of complaint were as follows: knee (30.59%), dorsolumbar (28.83%), shoulder (22.26%) and neck (17.07%). The most common rheumatic diseases were osteoarthritis and low back pain with the prevalence of 18.66% and 17.71%, respectively. Finally, the prevalence of rheumatoid arthritis was 0.98%.

**Conclusion:** Musculoskeletal complaints are highly common in southeast Iran. Knee and low back pain were the most common sites of complaints. The most frequent diagnosed diseases were osteoarthritis of knee followed by low back pain and soft tissue rheumatism. Rheumatoid arthritis was the most prevalent inflammatory disease.

**Key words:** Community Oriented Program for the Control of Rheumatic Disease, epidemiology, musculoskeletal disorders, prevalence.

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## INTRODUCTION

Musculoskeletal (MSK) complaints are very common and are a significant cause of morbidity in society; furthermore, the knowledge about the burden of MSK

disorders in developing countries is lower than that in developed countries. Community Oriented Program for Control of Rheumatic Diseases (COPCORD) was proposed for estimating the prevalence of MSK and rheumatic diseases in developing countries. COPCORD was designed by the World Health Organization (WHO) and the International League of Associations for Rheumatology (ILAR) in 1981 to fill this gap in knowledge. COPCORD consists of three stages: stage 1, epidemiological survey of rheumatic disease; stage 2, education of primary health care professionals for management of widespread rheumatic diseases; and stage 3, improving health care and studying the etiologic factors in rheumatic diseases. The First COPCORD Study was performed in the Philippines.<sup>1</sup> Other studies with COPCORD design were carried out in Indonesia,<sup>2</sup> India,<sup>3,4</sup> China,<sup>5-8</sup> Vietnam,<sup>9</sup> Cuba,<sup>10</sup> Australia,<sup>11,12</sup> Bangladesh,<sup>13</sup> Kuwait,<sup>14</sup> Pakistan,<sup>15</sup> Malaysia,<sup>16</sup> Thailand,<sup>17</sup> Mexico<sup>18,19</sup> and Brazil.<sup>20</sup>

A few studies on MSK disorder prevalence have so far been conducted in Iran. The COPCORD study was carried out in Tehran,<sup>21</sup> and rural areas in Fasham<sup>22</sup> which is located in the northern suburbs of Tehran and five villages in Tuyserkan,<sup>23</sup> a small town in the northwest of Iran.

We conducted stage 1 of the COPCORD study to determine the prevalence of MSK complaints and rheumatic diseases in Zahedan, an urban area of southeastern Iran.

## MATERIAL AND METHODS

### Community

The present study was carried out in Zahedan, the capital of Sistan and Balouchestan province, Iran. This city has an estimated population of 681 460 and is located at an altitude of 1352 m above sea level and about 29° north latitude. Its distance from Tehran, capital of Iran, is about 1605 km (Fig. 1). Citizens of Zahedan are mainly from two ethnic groups, Balouch and Fars, both of whom are Caucasian. This province is among the underdeveloped regions in Iran, thus the socioeconomic level is very low. The subjects of this study were more than 15 years old who had been living in the area for more than 6 months.

### Sampling

The method of cluster sampling was the same as the Tehran COPCORD study.<sup>21</sup> To select the subjects, the city was divided into 20 geographical divisions. Then, in each division, one house was selected randomly as a



Figure 1 Zahedan location in Iran where the current study was performed.

starting point or 'Cluster Head'. Each cluster consisted of a Cluster Head and its right neighboring consecutive houses to make a cluster of approximately 100 subjects.

### Questionnaire

The Persian version of the COPCORD Core Questionnaire (CCQ) which had been validated in the Tehran COPCORD study<sup>21</sup> was applied for the first two phases of this study. The CCQ contained demographic data, work history, MSK complaints (pain, stiffness and swelling) within the preceding week and in the past, extra-articular symptoms of some rheumatic diseases (aphthous ulcers, blurred vision, etc.), functional disability, difficulty in doing special tasks, treatment and evaluation. AN English examination sheet was applied for the third phase of stage 1.

### Training of field data collectors

Two general practitioners (project managers) who knew the local inhabitants well enough were trained for the details of COPCORD methodology at the Rheumatology Research Center of Tehran University of Medical Sciences. A training workshop was held for 12 interviewers in Zahedan by the two project managers and a member of the COPCORD team from the Rheumatology Research Center. Moreover, some students from Zahedan University of Medical Sciences were trained as supervisors of the data collection team to monitor the data collection process, fulfill the special evaluation checklist, and manage the groups.

### Pilot study

A Pilot study was conducted to assess the possibilities and limitations of the COPCORD study and evaluate population compliance. Two members from the Rheumatology Research Center in Tehran who were familiar with the COPCORD model went to Zahedan to assist. Fifty subjects in one of the clusters were selected randomly. On Thursday, the population had been identified by the project managers and some of the interviewers. Then, the selected population was informed about the aims of the study. The Pilot study was carried out from 8 a.m. to 8 p.m. on Friday which was a weekend holiday. After that, the subjects in the selected cluster were visited by the trained interviewers in their houses. Then, cases with MSK complaints (pain, stiffness and swelling) or history of oral ulcer were referred to hospital by the head manager. Two rheumatologists were available in the clinic of Ali Ebne Abitaleb Hospital. After taking histories and clinical examinations, laboratory and radiological investigations were carried out if indicated in the same hospital.

### Data collection

In this study, phase 1 and 2 were carried out in parallel. The study was done on Mondays. Subjects, who were not present at the first visit, were visited on Thursdays and Fridays. Therefore, interviewers went to the subjects' houses three times. Every cluster was visited by one single team within a week so that the first two phases were conducted house to house and phase 3 was performed in hospital for the first four clusters. In other fields all three phases were carried out at the houses of the subjects. A television program publicized the aim of the study. Moreover, religious leaders of the population were informed about the purpose of the study. They presented the information to the population to encourage their collaboration and compliance. Ten interviewers were chosen from nurses or midwives. The team consisted of six interviewers, two manager, two rheumatologists, two assistants, one supervisor for interviewers, one laboratory technician and one driver. There was one team for the study. On Sundays, one manager and some of the interviewers went to the selected area and distributed the COPCORD posters. They explained the plan of the study to the families and identified those families likely to cooperate. On Mondays, a team went to the already identified area. First, the interviewers introduced themselves. Then, all members of the family over 15 years old were registered on family folder forms. The CCQ was completed for each subject by the

interviewers, and all subjects marked the site of pain on a body picture in the CCQ. The family folder was presented to the manager to check if the CCQ was correctly completed. Moreover, the supervisors fulfilled special checklists for random selected subjects to control the quality of data. Persons with MSK problems were referred to the hospital by the head manager for phase 3 which was conducted similar to the pilot study for the first four clusters. There was weak compliance of the subjects in the first four clusters, therefore, in the 5th to 20th clusters, subjects with MSK complaints were introduced to the rheumatologist who was present in the field. If necessary for the categorizing of diagnoses, subjects were referred to the laboratory technician who was present in the field and referred to the hospital for radiographic exam by the rheumatologist. Two assistants coordinated phases 2 and 3. They also checked physical examination sheets and returned them to the rheumatologist if they was not filled out properly.

### Diagnosis

American College of Rheumatology (ACR) classification criteria was applied for diagnosis of osteoarthritis (OA) of hand, knee and hip, rheumatoid arthritis (RA) (1987 ACR criteria), and systemic lupus erythematosus (SLE0 (1997 ACR criteria). The European Spondyloarthropathy Study Group preliminary criteria was used for classification of spondyloarthropathy. However, for other problems for which there was no classification criteria, the diagnosis was based upon clinical judgment. Low back pain was defined as a complaint below the costal margin and above the inferior gluteal folds due to specific or non specific etiology. Clinical diagnosis was made and recorded on examination sheets in the field for the majority of subjects. Para-clinical data and physical examination sheets of cases that needed more investigation were evaluated by the same rheumatologist for the prepared diagnosis at the Clinical Research Center of Ali Ebne Abitaleb Hospital, in the Medical Sciences University of Zahedan, Iran. Some cases were visited several times to make a definite diagnosis in the hospital.

### Ethical issues

The study was approved by the Ethics Committee at Zahedan University of Medical Sciences. Participants were enrolled in the study if they wanted to, and they could withdraw from the study whenever they wanted. This study was funded by the Medical Sciences University of Zahedan, Iran. The details of diagnosis, labora-

tory test and X-ray of every patient were returned to her/him.

### Data analysis

The minimum sample size necessary for COPCORD study was 1500 subjects. Therefore, we selected a sample of 2700 subjects. All data were entered into SPSS (SPSS Inc., Chicago, IL, USA) and STATA (StataCorp, College Station, TX, USA) software for analysis. The prevalence of muscular disorders was adjusted to age–sex distribution of the study population from the 2006 Census. Prevalence rates were presented as% (95% confidence interval [CI]).

## RESULTS

The data were collected from October 10, 2008 to September 15, 2009. Of 2700 subjects, 2100 were interviewed in 681 houses, and 1204 out of 2100 were visited by rheumatologists. Therefore, the response rate was 77.7% and 77.02% for phases 1 and 3, respectively.

### Age, sex

The study population consisted of 921 (43.9%) males and 1179 (56.1%) females. The mean age of these individuals was  $33.1 \pm 14.7$  years (mean  $\pm$  standard deviation). Age and sex distribution of the study population and at the last census is shown in Figs 2 and 3.

### Educational levels

Of the subjects, 17.1% were illiterate, 6.6% of them were at primary school level, 8.5% of them had finished primary school successfully, 26.5% had left secondary school unfinished and 22.2% had received their diploma in secondary school; 16.9% had entered university, and finally 1.6% included the rest of the population.

### Occupations

Studied participants were asked to determine their last four jobs. The occupations with highest prevalence were: home-making (37.5%), college or university students (31.2%), employees (17.6%), unemployed (10.5%), skilled and unskilled manual workers(5.8%) and drivers (5.7%). Some of the subjects had more than one job.

### Musculoskeletal complaints within the seven preceding days

After adjusting to age–sex distribution of the population, the prevalence of MSK complains within the past

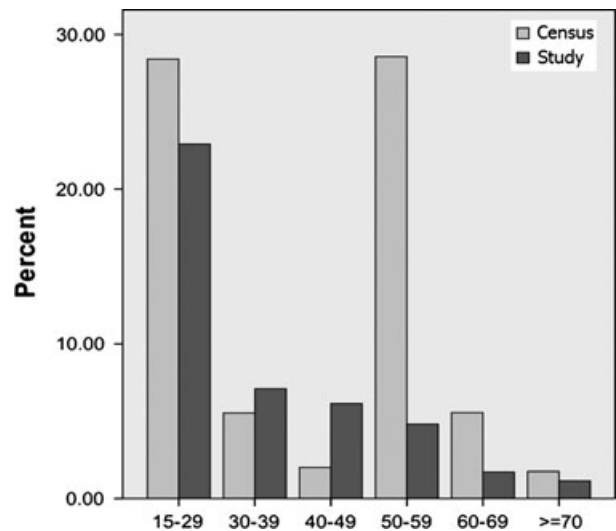


Figure 2 Age distribution (male) comparing the COPCORD study and the 2006 Zahedan census.

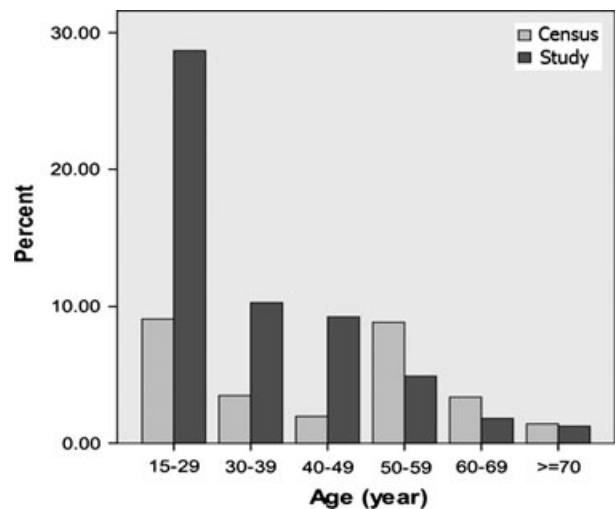


Figure 3 Age distribution (female) comparing the COPCORD study and the 2006 Zahedan census.

7 days was 54.13% (52.00–56.26). The prevalence was 66.2%, (62.1–70.1) in females and 39.6%, (34.60–44.70) in males. Age and sex distribution of those with complaints are shown in Table 1. The prevalence of non trauma MSK complaints was 45.38% (43.12–47.63), comprising 29.82% (26.66–32.98) in males and 61.24% (58.32–64.16) in females. The most prevalent MSK complaints were the knee with 30.59% (8.62–32.56), back 28.83, (26.90–30.77), shoulder 22.26%,

**Table 1** Age-sex distribution of musculoskeletal complaints within the past 7 days

Age (years)	Men% (95% CI)	Women% (95% CI)	All% (95% CI)
29–15	30.8 (24.1–37.3)	54.92 (49.4–60.2)	44.3 (39.5–49.1)
39–30	41.2 (33.07–49.8)	73.4 (65.6–80.1)	60.3 (54.6–65.7)
49–40	41.8 (32.1–52.2)	76.9 (69.05–83.3)	62.8 (57.0–68.2)
59–50	61.6 (51.8–70.5)	81.5 (71.9–88.3)	71.7 (64.6–77.9)
69–60	61.11 (47.1–73.4)	92.1 (76.8–97.6)	77.03 (66–85.2)
70 and over	66.6 (41.4–84.9)	88.4 (68.01–69.5)	78 (60.5–89.1)
Total	39.6 (34.6–44.7)	66.2 (62.1–70.07)	54.5 (50.7–58.3)

(20.48–24.04), neck 17.07%, (15.46–18.68), wrist 14.82%, (13.30–16.34), ankle 12.52%, (11.10–13.94), hand 12.40%, (10.04–12.76), pelvic 10.69%, (9.37–12.01), elbow 9.25% (8.01–10.49) and toes 7.61%, (6.48–8.75) (Table 2).

### Diagnosed diseases

Osteoarthritis was the most diagnosed disease so that 18.66% (17.00–20.33) of the subjects had OA in at least one joint. Knee was the most common joint of OA with the prevalence of 15.29%, (13.75–16.83). Cervical OA and OA of hand or hands were 3.22% (2.46–3.97) and 2.02% (1.42–2.63), respectively. The second most prevalent disorder was low back pain with 17.71% (16.08–19.35) prevalence. The prevalence of low back pain was 12.52% (0.38–14.66) in males and 23.02% (20.62–25.42) in females. The prevalence of tendinitis, tenosynovitis and bursitis in total was 4.19% (3.34–5.05). In Table 3 the prevalence of the most common mechanical disorder and inflammatory diseases is summarized. Among the inflammatory diseases, the prevalence rates RA have been 0.98% (0.56–1.40), spondyloarthropathies 0.25% (0.08–0.46), SLE 0.19% (0.00–0.38) and gout 0.07% (0.04–0.19).

### Disability

Of the subjects, 22.4% reported different degrees of functional disability in doing specific tasks at the time of interview due to their MSK complaint. The prevalence of complete functional disability for different tasks were as follows: sitting with both knees flexed sideways on the left or right sides (5.9%), praying (5.2%), gripping and opening bottles (3.1%), squatting in restrooms (2.8%), bending over to pick up objects from the floor (2.6%), walking (2.4%), washing the body (1.8%), climbing up (0.9%) and getting on and off of a bus (0.9%).

### DISCUSSION

This study was undertaken to assess the prevalence of MSK complaints in Zahedan city. The city is one of the most deprived urban areas in Iran where most people have traditional lifestyles. The birth rate is the highest in this province of Iran and families are large with 5–8 children on average. People usually sit on the floor rather than chairs in their homes and houses have squat toilets, used by squatting rather than sitting. People have to carry heavy objects such as container barrels of purified water and liquid gas cylinders due to lack of

**Table 2** Sex distribution of musculoskeletal complaints within the past 7 days

	Men%† (95% CI)	Women%† (95% CI)	All%† (95% CI)
Shoulder	14.39 (12.13–16.66)	30.28 (27.66–32.90)	22.26 (20.48–24.04)
Elbow	5.46 (3.90–6.93)	13.11 (11.19–15.04)	9.25 (8.01–10.49)
Wrist	7.23 (5.55–8.90)	22.58 (20.19–14.96)	14.82 (13.30–16.34)
Hand	5.23 (3.79–6.67)	17.70 (15.52–19.87)	11.40 (10.04–12.76)
Hip	5.60 (4.12–7.09)	15.89 (13.80–17.97)	10.69 (9.37–12.01)
Knee	21.39 (18.73–24.03)	39.98 (37.18–42.78)	30.59 (28.62–32.56)
Ankle	86.64 (6.83–10.46)	16.48 (14.36–18.60)	12.52 (11.10–13.94)
Foot	5.03 (3.63–6.46)	10.24 (8.51–11.97)	7.61 (6.48–8.75)
Cervical	9.02 (7.17–10.87)	25.30 (22.82–27.70)	17.07 (15.46–18.68)
Dorsolumbar	18.91 (16.38–21.44)	38.97 (36.18–41.75)	28.83 (26.90–30.77)

†Percentage was adjusted to age–sex distribution of the population census.



**Table 3** Sex distribution of mechanical disorders and inflammatory disorders

	Men%† (95% CI)	Women%† (95% CI)	All%† (95% CI)
Carpal tunnel syndrome	1.00 (0.35–1.64)	2.40 (1.53–3.28)	1.69 (1.14–2.24)
Trigger finger	0.12 (0.10–0.35)	0.00 (0.00–0.00)	0.06 (0.00–0.16)
De Quervain tenosynovitis	0.41 (0.00–0.82)	0.40(0.04–0.76)	0.40 (0.13–0.67)
Tennis elbow	0.54 (0.07–1.02)	1.10 (0.51–1.70)	0.82 (0.43–1.20)
Golf elbow	0.19 (0.09–0.46)	0.00(0.00–0.00)	0.09 (0.03–0.22)
Shoulder rotator cuff	1.39 (0.63–2.14)	1.44 (0.76–2.12)	0.14 (0.90–0.19)
Frozen shoulder	0.23 (0.08–0.54)	0.62(0.17–1.07)	0.42 (0.14–0.70)
Fibromyalgia	0.90 (0.35–1.63)	3.66 (2.59–4.73)	2.31 (1.66–2.95)
Sciatica	1.20 (0.50–1.91)	0.20 (1.28–2.91)	1.64 (1.09–2.18)
Cervical radiculopathy	1.14 (0.45–1.82)	1.31 (0.66–1.96)	1.22 (0.75–1.69)
Hypermobility	0.94 (0.32–1.57)	1.87 (1.10–2.64)	1.40 (0.89–1.90)
Chondromalacia patella	0.12 (0.10–0.34)	1.25 (0.61–1.88)	0.67 (0.32–1.02)
Rheumatoid arthritis	0.71 (0.17–1.25)	1.26 (0.62–1.90)	0.98 (0.56–1.40)
Spondyloarthropathies	0.23 (0.08–0.55)	0.27 (0.02–0.57)	0.25 (0.03–0.46)
Systemic lupus erythematosus	0.11 (0.01–0.77)	0.25 (0.08–0.73)	0.19 (0.00–0.38)
Gout	0.07 (0.10–0.24)	0.08 (0.08–0.23)	0.07 (0.04–0.10)

†Percentages were adjusted to age-sex distribution of the population census.

central water purification or a natural gas system in the city. Moreover, most people do not do regular exercise. Therefore, a high prevalence of MSK complaints in the population was anticipated.

The present study showed that the prevalence of MSK complaints within the preceding 7 days was 54.13%. The most frequent complaint was pain; that means frequency of complaint and pain is nearly equal. The most common sites of complaints were knee, dorso-lumbar, shoulder and neck, respectively. The most frequent diagnosed diseases were OA of the knee followed by low back pain and soft tissue rheumatism. RA was the most prevalent inflammatory disease (0.98%). MSK complaints were more common in women than in men. In the present study, the male to female ratio (921 : 1179) was lower compared to that (349 833 : 331 627) in the last Zahedan census ( $p < 0.001$ ). This could be due to time of interviews when most males were at work. We visited subjects over 3 days, one of which was a weekend holiday (Friday). To deal with this issue, the prevalence rates were adjusted to age-sex distribution of the population in the last census.

Data from COPCORD studies in Iran is presented in Table 4. According to the results of other COPCORD studies in Iran, the prevalence of MSK complaints in Zahedan (54.13%) was greater than that in Tehran (41.9%) in contrast to that in Tuyserkhan (66.6%). Among the three communities in Iran, there was linear association between prevalence of illiteracy (25%, 17.7% and 7% in Tuyserkhan, Zahedan and Tehran,

respectively) and rate of MSK complaints. Furthermore, the prevalence was higher in Zahedan compared to that in urban and rural areas of other countries in the Asian-Pacific region. The highest reported frequency of rheumatic complaints by the COPCORD model in the Asian-Pacific region, excepting Iran, was 40% in China (Beijing), 34% in Australia and 33% in Australian Aborigines, and the lowest rate was reported in China, Shantou (9.7%), Vietnam (14.5%) and Pakistan (14.8%). Some of these figures were reported in studies undertaken about a decade ago, for example, the Pakistan COPCORD study. Therefore, the higher rate of MSK disorders in Iran could be due to time differences. However, the reported prevalence of MSK pain in recent COPCORD studies in Pune<sup>4</sup> (14.1%), Mexico<sup>18</sup> (19.6%) and Lebanon<sup>24</sup> (24.4%) was lower than the Zahedan COPCORD study. Moreover, it is likely that families with members with MSK pain were eager to cooperate and those without MSK pain were less agreeable. Therefore, further study is necessary to explain the high frequency of MSK complaints in this area. In the COPCORD literature, there is no explanation for inconsistency in MSK pain or complaint prevalence. Moreover, there are conflicting data on the prevalence of MSK complaints in urban versus rural areas. Although ethnicity, socioeconomic, demographic, psychosomatic and geographic (high altitude) factors have been suggested in some studies, these suggestions have not been confirmed by other studies. For instance, the rate of MSK pain was nearly similar in rural, urban, slum and affluent area of Bangladesh.<sup>13</sup> Also, in comparison, the

**Table 4** COPCORD studies in Iran

	<i>n</i>	Pain	Back pain	Neck pain	Knee pain	OA	STR	FM	RA	SPA	Gout
Fasham (rural)	2502	48.1	18.5	6.4	17.9	16.1	6.4	1.3	0.32	0.08	0.28
Tehran (pilot study)	284	34.5	22.2	13.7	26.1	14.5	2.4				
Tehran (urban)	10291	41.9	21.7	13.4	25.5	16.6	4.6	0.7	0.33	0.23	0.13
Tuyserkhan (rural)	1565	66.6	41.9	17.9	39.2	20.5	2.2	1.3	0.32	1.1	
Zahedan (urban)	2100	55.13	28.83	17.0	30.5	18.66	4.19	2.3	0.98	0.25	0.07

*N*, population interviewed; LBP, low back pain; OA, osteoarthritis; STR, soft tissue rheumatism; FM, fibromyalgia; RA, rheumatoid arthritis; SPA, seronegative spondyloarthropathies.

prevalence of rheumatic disease between rural, poor urban and affluent urban areas in Pakistan, there was no significant difference between rural and poor urban areas, but it was greater in affluent urban regions. On the other hand, Joshi and coworkers found lower frequency of self-reported pain sites in the urban areas of Pune than neighboring Bhigwan rural communities.<sup>4</sup>

MSK complaints were obviously more frequent among the elderly than young people which is in line with the results of all other studies. An important finding in our study was high prevalence of MSK complaints in the younger population. MSK complaints were estimated at 44.3% in people aged 15–29 years in this study compared to 51.1% pain, 10.2% swelling and 36.5% stiffness in the Tuyserkhan COPCORD study. However, 27.9% pain, 5.3% swelling and 14.5% stiffness was reported in the Tehran COPCORD study in the same age group. Considering the proportion of the younger population in Iran, more investigation is needed to elucidate the cause of high prevalence of MSK complaints. Rheumatic complaints for people aged 15–35 years old was 4.8%, 9%, 5.3% and 8.4% in four surveys of the Shantou China study,<sup>5</sup> and 28.6%, 39.7% and 37.3% in urban and rural communities in Bangladesh. Lifestyle could be the key point for such variations in statistics in different areas.

Results of COPCORD studies in Iran are depicted in terms of sites of MSK complaints in Fig. 4. The most commonly affected sites were knee, dorsolumbar, shoulder and neck in all three communities. Similarly, 'knee (7–41%) and low back pain (6–35%) were the most frequent pain sites in all other COPCORD studies'.<sup>25</sup> However, the most prevalent MSK complaint was shoulder pain (14.3%) in Lebanon and knee pain (12.1%) followed by hand pain (8.2%) in Mexico.

The frequency of OA was 18.66% in Zahedan compared to 16.6 in Tehran and 20.5 in Tuyserkhan. In other COPCORD studies, the prevalence varied from 4% in Lebanon to 11.3% in Thailand. Similar to other studies, most OA was found in the knee. The prevalence of knee

OA was 15.29% in our study, 15.3% in Tehran and 19.3% in Tuyserkhan. In comparison with other COPCORD studies, a remarkable finding was high frequency of OA in Iran which might be related to the lifestyle and living conditions in this area. Prevalence of knee OA was greater in affluent urban than poor urban and rural areas in Pakistan. This figure was explained by greater body weight in persons of affluent compared with poor areas. However, body mass index was not precisely compared in that study. Similar to most Asian countries, frequency of hip OA was low in our study. It was 0.33% in Zahedan, 0.32% in Tehran and 0.13% in Tuyserkhan.

In the current study, the prevalence of RA and SLE were 1% and 0.19%, respectively, which was higher than those in Tehran and rural areas of Tuyserkhan. These figures were the same as that reported in studies conducted in Iraq (1%),<sup>26</sup> Lebanon (1%), Kuwait (0.7%) and Australia (0.7%), but it is lower than reported prevalence of RA in Mexico (2.8%, 1.6%).<sup>18,19</sup> Reported frequency of RA in the Middle East (0.2%–0.5%) and mean prevalence of RA in APLAR countries (0.33%)<sup>27</sup> is lower than that in Western countries. The prevalence of spondyloarthropathy was the same in Zahedan and Tehran, but it was more frequent in rural areas of Tuyserkhan.

There are, of course, some limitations in the COPCORD method. It is exhaustive and time-consuming for both interviewers and study subjects. Therefore, responses may not be accurate. Although all COPCORD studies use standard unique CCQ, reported data are not the same. For example, some investigators<sup>14,18–20</sup> reported the prevalence of non-traumatic pain. Other investigators did not report traumatic and non-traumatic causes separately. In our study, subjects who needed to be visited by a rheumatologist for physical examination were referred to hospital in the first four clusters, but the weak compliance of the subjects affected the response rate. Therefore, the rheumatologists visited subjects at their homes for the other 16 clusters. Although a cluster sampling is used in this

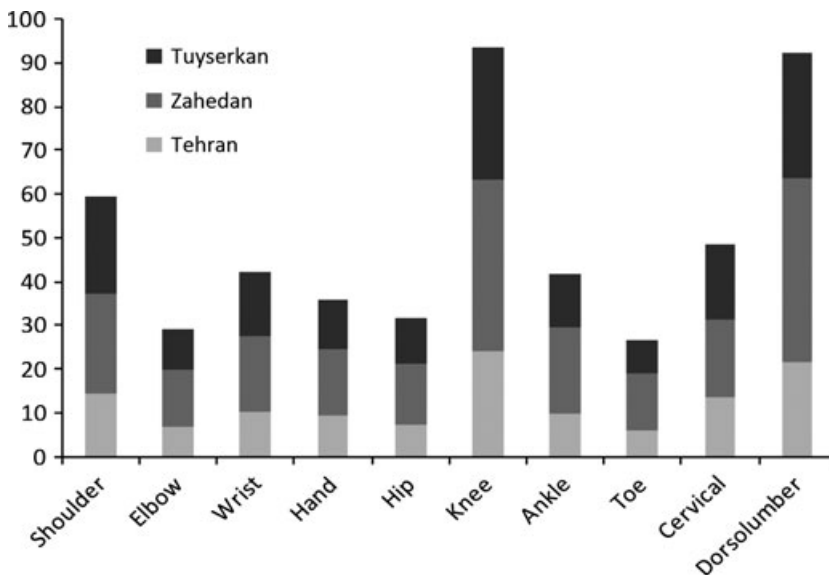


Figure 4 Prevalence (%) of musculoskeletal complaints within the past 7 days in Iran.

study and recurrent visits were done in the field, results revealed that age–sex distribution of our sample was not concordant with the population. This can be considered as the most important limitation of this survey.

It may be concluded that rheumatic complaints are highly prevalent in the southeast of Iran. These documented findings have to alert governments to plan programs for prevention and management of MSK disorders in society. In addition, explanatory studies should be performed to investigate more the etiologic factors.

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