Article

High burden of musculoskeletal conditions: a problem that has only recently come to recognition

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Abstract

Objectives: Musculoskeletal conditions have only recently been acknowledged and research on their burden is scarce in the Middle East and North African (MENA) region. For the first time, a population based study was conducted in Lebanon to assess the prevalence, level of disability, and health seeking behaviours related to musculoskeletal pain and rheumatic disorders.

Methods: A random sample of 500 participants aged $\geq$ 15 years from Southern Lebanon was interviewed using the COPCORD (Community Oriented Program for Control of Rheumatic Diseases) questionnaire.

Results: The prevalence of current musculoskeletal pain was 31.2% [CI (27.0–35.2%)]. Being a female [OR=1.8, CI (1.2–2.8)] and of advancing age [OR=1.03, CI (1.01–1.05)] were the only significant factors associated with current musculoskeletal pain. Prevalence of current functional disability was 6.4% [CI (4.2–8.5%)]. Around quarter (26.0%) [CI (22.3–30.1%)] of our sample sought some kind of treatment. The overall prevalence rate of rheumatic disease was 17.0% [CI (13.7–20.3%)].

Discussion: Our findings indicate that musculoskeletal conditions are common in Lebanon. This is a timely public health issue that needs further investigation and solid recognition by health authorities. Community-based interventions should target patients to prompt them to seek early help in order to prevent the development of musculoskeletal pain into disorders.

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Introduction

Many aspects of the current world population health are related to the rapid epidemiological and demographic transition. With the aging of the world's population and the rapid changes in lifestyle brought by globalization and urbanization, the increase in the prevalence of chronic and disabling diseases is inevitable.[1] In 2008, it was estimated that chronic diseases accounted for 61% of total disability-adjusted life years in people aged 15–59 years, and 84% of the burden in those aged 60 years and older.[2] Musculoskeletal pain is one type of chronic condition that has greatly increased compared to 40 years ago[3] and is responsible for a high proportion of disability, lost productivity and a significant consumption of health and social resources.[4,5]

It is important to note that the presence of musculoskeletal pain does not always reflect an underlying organic disease; therefore, it is often left dismissed in epidemiological research. Clinically, the situation is no different and chronic pain is underestimated by physicians. In light of this compounded situation, several initiatives such as the Bone and Joint Decade (2000–2020), Arthritis Action Group, and the Community Oriented Program for Control of Rheumatic Diseases (COPCORD) have played crucial roles in highlighting the burden of musculoskeletal pain. In Europe, 20–30% of adults are affected at one point in time by musculoskeletal pain.[6] The prevalence figures reported in COPCORD studies in the Asia Pacific region were as low as 9.7% in Shantou (China) and as high as 54.3% in rural Iran.[7]

In Lebanon, national figures of common musculoskeletal pain such as lower back, knee, hip and shoulder pain are not emphasized. Early population-based research on musculoskeletal conditions in Lebanon assessed self-reported prevalence of arthritis and chronic back pain in Beirut, the capital of Lebanon, and found a 3.9% prevalence of back pain.[8] Other recent studies have tackled the frequency of musculoskeletal diseases and were based on clinical samples.[9,10] Also, the provision of care and awareness about musculoskeletal pain in Lebanon is crippled by the few rheumatologists ($n=50$) and trained health workers available. This can result in increased morbidity and delayed diagnosis of any underlying musculoskeletal diseases.

The current population-based study was carried out to assess the prevalence of musculoskeletal pain, level of disability, and health seeking behaviours in the Lebanese population, and to identify factors associated with the pain, specifically work, obesity and physical activity.

Methods

Study design and population

A population-based, cross-sectional study consisting of two phases was carried out in the two southern governorates, representing 16.6% of the Lebanese population.[11] The two governorates are a mixture of rural and urban areas and the residents belong to different religious sects, both Christian and Muslim.

A final random sample of 500 participants aged 15 years and over was selected. Data of the Lebanese 2004 population from the Central Administration for Statistics (CAS) was used to proportionately select the participants from the two governorates and their seven districts (Cazas).[11] At the district level, a cluster sampling was performed by

randomly choosing a number of villages and/or cities in addition to the centre of the district. The number of participants selected from each village and city was proportionate to the distribution of the Lebanese population in these areas according to the electoral list of the year 2000. In each selected village and city, systematic sampling of households was done, where every third or fourth household from a randomly chosen starting point was selected.

The instrument

The Arabic version of the WHO-ILAR COPCORD Core Questionnaire (CCQ) used in Kuwait[12] was adapted to the Lebanese culture with few changes introduced. The modified questionnaire was pilot tested on 18 individuals. It included a section inquiring about socio-demographic information (age, gender, education occupation and income), and a second main section consisting first of questions inquiring about current and past musculoskeletal problems at nine locations and second about self-reported ratings of pain as mild, moderate, severe, or very severe according to a Visual Analog Scale VAS (0 for no pain and 10 for very severe pain). Questions also addressed functional disability defined as mild limitation in performing specific daily tasks. Health seeking behaviour with a comprehensive list of options was assessed, in addition to weight and height measurements and questions on physical activity.

Field work and data management

Phase I Trained university students conducted the interviews with one individual within a household. This individual was randomly selected using random digit tables. If the randomly selected person was less than 15 years old, or had problems in communication, another randomly selected

person was chosen for the interview. To avoid selection bias, interviews were conducted at different times of the day on weekdays and weekends.

After screening for musculoskeletal complaints, an appointment for a second visit was taken if the participant was a 'positive respondent' or in other words suffering from musculoskeletal problems in the last 7 days. The response rate in the first phase of the study was 98%.

Phase II Door-to-door visits were done by rheumatologist fellows after around 1 month (ranging from 20–50 days) from the first visit. Physical examinations were performed on the positive respondents to diagnose musculoskeletal disorders.

Statistical analysis

Because of over-sampling of males, weighted coefficients were calculated based on the gender and age distribution of the total Lebanese population and the participant study population. Analysis was done based on the weighted data. Overall prevalence and age specific rates of musculoskeletal pain were calculated. Contingency tables and Chi square tests were done to compare proportions with musculoskeletal pain in the last 7 days by gender, age, marital status, work status, education, total monthly income, physical activity and obesity. Un-adjusted and adjusted odds ratios for factors associated with musculoskeletal pain were calculated. Significance was set at 5%. All analyses were done using the Statistical Package for Social Sciences (version 16, Chicago, USA).

Ethical considerations

The study was approved by the Institutional Review Board at the American University of Beirut. Written informed consent for both visits was obtained from the respondents

prior to the interview. Guardians' signatures were requested for participants who were under the age of 18 years. Confidentiality was ensured by analysing data based on ID numbers assigned to each questionnaire. Data were stored in locked areas only accessible to the study researchers. All patients received advice regarding their pain complaints.

Results

Characteristics of the sample

The mean/standard deviation (SD) age of the participants was 38.1/16.9 years old (range 15–87). There were higher proportions of males (56.4%) and ever-married respondents (58.5%). Half the respondents

were working at the time of the survey. Table 1 presents the socio-demographic variables for the total sample and by governorate. Minor differences were noted between the two governorates in all variables.

Prevalence of musculoskeletal pain

Pain in the last 7 days (*current pain*) The overall point prevalence of current musculoskeletal pain was 31.2% [CI (27.0–35.2%)]. Table 2 reports site-specific and sex-specific prevalence rates.

Females (35.8% [CI (29.4–42.3%)]) had a higher prevalence of current mucsculoskeletal pain than males 26.4% [CI (21.3–31.6%)].

Table 1. Demographic characteristics of the sample

Variables	Al Nabatieh N = 177	South Lebanon N = 323	Total N = 500
Age, yrs, mean ± SD	41.6±17.5	36.3±16.3	38.1±16.9
Gender (%)			
Male	59.3	54.8	56.4
Female	40.7	45.2	43.6
Marital status (%)			
Single	39.1	42.6	41.4
Married	55.7	50.8	52.5
Widowed	4.0	5.3	4.8
Divorced	1.1	1.2	1.2
Education (%)			
Illiterate	5.1	6.5	6.0
Read and write	5.1	3.1	3.8
Elementary	9.0	13.7	12.0
Intermediate	30.5	28.9	29.5
Secondary	27.1	25.8	26.3
University	23.2	22.0	22.4
Work status (%)			
Yes	53.1	49.8	51.1
Total income/month (%)			
No monthly income	3.4	1.2	2.0
< 500,000 L.L	8.0	7.8	7.9
500,000–<750,000 L.L	19.5	17.4	18.1
750,000 –< million L.L	36.2	35.1	35.5
Million–<3 million L.L	29.9	34.5	32.9
>3 million L.L	2.9	4.0	3.6

Table 2. Site-specific and sex-specific prevalence rates of current musculoskeletal pain

	Total % (CI at 95%)	Male % (CI at 95%)	Females % (CI at 95%)
Shoulder	16.4 (13.2–19.7)	10.2 (6.7–13.8)	22.6 (17.0–28.2)
Wrist	7.9 (5.6–10.3)	3.5 (1.3–5.7)	12.3 (7.9–16.7)
Hand	9.1 (6.6–11.6)	5.0 (2.5–7.6)	13.2 (8.7–17.7)
Hip	6.5 (4.3–8.7)	3.5 (1.3– 5.6)	9.6 (5.6–13.5)
Knee	16.1 (12.8–19.3)	12.7 (8.8–16.6)	19.4 (14.1–24.7)
Ankle	6.5 (4.3–8.6)	1.7 (0.2–3.2)	11.2 (7.1–15.5)
Toe	3.8 (2.1–5.5)	1.2 (0.0–2.5)	6.5 (3.2–9.7)
Neck	13.0 (10.0–16.0)	6.0 (3.2–8.8)	20.0 (14.6–25.3)
Spine	13.8 (10.8–16.8)	10.3 (6.7–13.8)	17.3 (12.2–22.4)

The most commonly reported location of pain was shoulder, followed by knee, back and neck. In all locations, prevalence of pain was higher in women than men.

Stratification by age showed that current musculoskeletal pain increased with age up to 64 years, after which it decreased (Table 3).

Among the sufferers from current musculoskeletal pain, the majority reported multi-site pain (70.9%). There were numerous combinations of pain sites. The most common ones were back and knee, and back and neck. In all locations, the greatest majority reported chronic pain ($\geq$ 3 months). The mean $\pm$ SD of pain intensity on the VAS was 5.8±2.2. Pain severity was described as severe in almost 30% of cases, and the rest reported mild or moderate pain (30.7% or 40.3%, respectively). One-fifth (28 participants) reported a trauma which could explain their musculoskeletal pain. Of these, falls were reported by 37%, car accidents by 33.8%, and bone fractures or strain by 12.8%.

Table 4 reports un-adjusted and adjusted OR of pain with selected socio-demographic and other variables. Being a female [OR=1.8, CI (1.2–2.8)], and of advancing age [OR=1.03, CI (1.01–1.05)], were the only significant factors associated with pain in the last 7 days.

Pain in the past Participants who reported having musculoskeletal pain in the past constituted 8.9 % [CI (6.4–11.4%)] of the sample. The mean $\pm$ SD pain score was 4.9±2.0 (in a 0–10 VAS). Around one-fourth described their pain as severe. Of the 45 participants, 10 reported having experienced trauma as a cause to their pain.

Functional disability

Prevalence of current functional disability was 6.4% [CI (4.2–8.5%)]. Females had a higher prevalence of current disability than males (9.7% [CI (5.7–13.6%)] v. 3.1% [CI (1.1–5.1%)], respectively).

Help seeking behaviour Around a quarter (26.0%) [CI (22.3–30.1%)] of our sample sought some kind of treatment. Physicians were the most common providers of treatment (23.6%), particularly rheumatologists and general practitioners (16.7% and 4.4%, respectively). Other less frequent types of treatment that were reported by the study participants were from pharmacists (N=4), physiotherapists (N=3), chiropractors (N=1) and traditional/herbal healers and self-medication (N=13).

Prevalence of rheumatic disorders

Eighty-five examinees were found to have rheumatic disorders, yielding an overall

Table 3. Age rates of current musculoskeletal pain in all sites

	Shoulder% (CI at 95%)	Wrist% (CI at 95%)	Hand% (CI at 95%)	Hip% (CI at 95%)	Knee% (CI at 95%)	Ankle% (CI at 95%)	Toe% (CI at 95%)	Neck% (CI at 95%)	Spine% (CI at 95%)
15–24	6.1 (2.2–10.1)	4.1 (0.8–7.4)	4.4 (1.0–7.8)	0.9 (0.0–2.4)	8.5 (3.6–12.7)	3.5 (0.4–6.5)	3.5 (0.5–6.6)	7.3 (3.0–11.6)	7.3 (2.3–11.2)
25–34	9.8 (3.6–15.9)	4.2 (0.04–8.2)	6.3 (1.3–11.3)	1.1 (0.0–3.3)	9.5 (3.4–15.5)	2.3 (0.0–5.3)	1.1 (0.0–3.3)	7.6 (2.2–13.0)	7.7 (2.2–13.1)
35–44	19.5 (11.4–27.5)	9.6 (3.6–15.6)	14.9 (7.7–22.2)	9.2 (3.2–15.0)	15.1 (7.8–22.4)	10 (3.8–16.0)	3.4 (0.0–7.0)	16.1 (8.6–23.5)	10.1 (3.9–16.2)
45–54	24.9 (14.6–35.6)	13.3 (5.2–21.7)	10.8 (3.4–18.5)	9.9 (2.7–17.2)	21.2 (11.4–31.3)	11.3 (3.7–19.0)	7.9 (1.4–14.5)	12.7 (4.7–20.9)	25.2 (14.8–35.9)
55–64	32.4 (18.3–45.4)	14.2 (3.9–24.0)	16.3 (5.4–26.7)	11.9 (2.4–21.0)	38.4 (23.9–52.1)	8.8 (0.5–16.8)	8.8 (0.5–16.8)	26.3 (13.2–38.6)	27.1 (14.0–39.7)
≥65	25.8 (12.8–38.5)	9.6 (0.9–18.1)	7.3 (0.0–14.9)	18.1 (6.7–29.3)	24.4 (11.7–36.8)	7.3 (0.0–14.9)	–	20.9 (8.9–32.7)	23.7 (11.0–35.9)

prevalence rate of 17.0% [CI (13.7–20.3%)]. The female prevalence rate (21.7% [CI (16.2–27.2%)]) is almost double that of the male prevalence rate (12.3% [CI (8.4–16.1%)]). Almost two-thirds (56 participants) were new diagnoses. On the other hand, nine participants who reported having previous diagnosis were not confirmed as having any rheumatic disorder. Undefined diagnosis of certain rheumatic disorders was seen in five participants who required further laboratory tests to ascertain their disorder.

The total and sex-specific prevalence rates of the different rheumatic disorders are shown in Table 5. The most frequent diagnoses were non-specific mechanical pain and osteoarthritis. Similar to muscusloekeletal pain, females had higher prevalence of rheumatic disorders than males and rheumatic disorders increased with age (Table 6).

Discussion

This cross sectional study was the first to provide population based data on the prevalence of musculoskeletal pain and rheumatic disorders in the Lebanese population and among the few studies conducted in the Middle East and North Africa (MENA) region. Musculoskeletal pain is of significant magnitude among the studied population, with one-third of the participants reporting current MSK pain and around one-sixth having rheumatic disorders.

Before reflecting on the results and comparing with literature, it is worth noting some methodological issues pertinent to the study. The studied areas in southern Lebanon were randomly selected and the sample is large enough to estimate accurately the prevalence of MSK pain and proportions of people seeking help; however, the sample was too small to determine the prevalence of rare rheumatic disorders, such as Behcet's disease, and their distribution among different population groups.

Table 4. Un-adjusted and adjusted odds ratio for factors associated with MSK pain in the last 7 days

Variables	Univariate analysis-Unadjusted odds ratios (CI at 95%)	Multivariate analysis-Unadjusted odds ratios (CI at 95%)
Gender		
Male	1.0	1.0
Female	**1.6 (1.07–2.3)**	**1.8 (1.2–2.8)**
Marital status		
Single	1.0	1.0
Ever-married	**1.8 (1.2–2.6)**	0.7 (0.4–1.3)
Age, yrs	**1.04 (1.02–1.05)**	**1.03 (1.01–1.05)**
Work status		
Yes	1.0	–
No	1.05 (0.7–1.5)	–
Education		
Illiterate/Read&write/Elementary	**3.5 (2.0–6.1)**	2.1 (1.0–4.5)
Intermediate	1.2 (0.7–2.0)	1.0 (0.5–1.8)
High school	0.7 (0.4–1.2)	0.6 (0.3–1.2)
University	1.0	1.0
Total income/month		
Income< 500,000 L.L	**2.7 (1.4–5.2)**	0.6 (0.3–1.5)
500,000L.L≤income<750,000 L.L	1.7 (1.0–3.0)	1.1 (0.6–2.1)
750,000L.L ≤income< million L.L	1.5 (1.0–2.4)	1.4 (0.8–2.3)
Income≥ million L.L	1.0	1.0
Body mass index		
≤25 (normal)	1.0	1.0
>25–30 (overweight)	0.7 (0.4–1.3)	0.8 (0.5–1.3)
>30 (obese)	**2.0 (1.1–3.4)**	1.6 (0.9–2.8)
Physical activity		
No	1.0	–
Yes, regularly	0.9 (0.3–2.5)	–
No, not regularly	0.7 (0.2–1.9)	–

The bold type face indicates variables significant at $p<0.05$.
Only the significant variables at the univariate level were used for the multivariate level.
Only 217 subjects were asked about their physical activity.

Table 5. Prevalence rates and sex-specific rates of selected rheumatic disorders

	Total % (CI at 95%)	Male % (CI at 95%)	Females % (CI at 95%)
Disease (*N*)			
Osteoarthritis (22)	4.4 (2.6–6.2)	4.1(1.8–6.5)	4.7 (1.8–7.5)
Non-specific mechanical pain (30)	6.1 (4.0–8.2)	5.1 (2.5–7.7)	7.0 (3.6–10.4)
Rheumatoid arthritis (6)	1.0 (0.3–2.0)	0.0	2.4 (0.6–4.8)
Fibromyalgia (6)	1.4 (0.4–2.5)	0.0	2.8 (0.6–5.1)
Carpal tunnel syndrome (7)	1.6 (0.5–2.7)	0.4 (0.0–1.2)	2.7 (0.6–4.9)

Table 6. Age specific rate of selected rheumatic disorders

	Osteoarthritis Total % (CI at 95%)	Non-specific mechanical pain Total % (CI at 95%)	Rheumatoid arthritis Total % (CI at 95%)	Fibromyalgia Total % (CI at 95%)	Carpal tunnel syndrome Total % (CI at 95%)
15–24	0.0	4.4 (1.0–7.7)	1.2 (0.0–3.5)	0.8 (0.0–0.02)	0.0
25–34	0.0	6.7 (1.5–11.8)	2.0 (0.0–5.0)	1.1 (0.0–3.3)	2.2 (0.0–5.2)
35–44	3.8 (0.1–7.7)	6.0 (1.2–10.8)	0.0	1.2 (0.0–3.4)	2.4 (0.0–5.6)
45–54	6.6 (0.6–12.6)	6.6 (0.6–12.6)	3.1 (0.0–8.0)	2.4 (0.0–6.1)	1.1 (0.0–3.7)
55–64	15.4 (4.7–25.6)	7.6 (0.0–15.3)	0.0	2.1 (0.0–6.3)	5.6 (0.0–12.2)
≥65	13.1 (3.1–22.9)	7.7 (0.0–15.6)	0.0	1.9 (0.0–5.9)	0.0

The response rate was high and can be explained by the positive attitude of people in southern Lebanon towards the objectives of the study. Additionally, the people were very cooperative with the door-to-door interviews by data collectors and rheumatologists. Laboratory exams and radiographs were not part of the survey which may have lead to overestimation of the prevalence of certain rheumatic disorders such as rheumatoid arthritis. Also, only participants with pain in the last 7 days were selected for medical evaluation. Therefore, those who already have a rheumatic disorder but are in remission did not report current symptoms which may have lead to a decrease in the prevalence estimate of musculoskeletal pain and rheumatic disorders.

Our results showed that the lifetime prevalence of musculoskeletal pain in the study population (40.1%) falls within the upper range of prevalence rates seen in various COPCORD studies (9.7–54.3%).[7] Geographical, environmental, genetic, cultural and personal factors may influence the prevalence of MSK pain. Data collection in our study was done at the beginning of the cold season. NG et al. (2004) showed that the majority of arthritis patients perceive an exacerbation of symptoms with weather changes, particularly with humidity and cold weather.[13] Another factor that can explain the difference in prevalence of MSK pain is latitude. Some investigators reported an association between latitude, temperature, climate and prevalence of MSK complaints.[14] In Zeng et al.'s (2004) study in China, prevalence rate of MSK complaints increased with increasing latitude,[14] which can explain the higher lifetime MSK pain prevalence in Lebanon (40.1%) (situated at 33°) compared to Kuwait (18.1%) (situated at 29°). Meanwhile a COPCORD study in urban Iran which is situated at 35° showed a prevalence of MSK complaints in the last 7 days of 41.9%[15] compared to 31.2% in Lebanon. This 11% difference cannot be only explained by difference in latitude (a mere 2° difference). Further ethnic, genetic, cultural and environmental factors can explain this difference, especially in that mixed ethnic origins characterize the population of Iran. The high lifetime prevalence of MSK complaints in southern Lebanon may also be explained by chronic psychological distress consequent to years of civil strife and repeated wars. In a population-based prospective study of adults aged 18–65 years who were free of chronic widespread pain, results showed that chronic widespread pain can be an expression of psychological distress.[16]

Our finding on the high prevalence of multi-site pain is in concordance with other studies.[17,18] This is an important finding as

multi-site pain is more highly associated with lower quality of life, increased use of health service and poor mental health than single-site pain.[18]

Prevalence of MSK pain being higher among women than among men is consistent with several COPCORD studies.[19,20] A study reported that Lebanese women, influenced by a culture that values housework and cleanliness, are heavily involved in domestic activities.[21,22] Also, Strazdins and Bammer[23] reported that increased occupational exposures such as repetitive work among women render them more susceptible to MSK pain. This work overload may account for the increased rate of MSK pain among women compared to men in the study context. Additionally, our findings showed that MSK pain in the last 7 days increased with age in both genders. It is well known that aging has been associated with degenerative process, and its relation with MSK pain is common in the literature.[19,20] In our study, prevalence of MSK pain in the last 7 days increased up to the age of 64, and then showed a decline. This can be explained by the fact that participants are either retired or given easier tasks after the age of 65. Therefore, physical effort and psychosocial and work-related stress are diminished, thus causing a decrease in MSK pain.

The overall prevalence of rheumatic disorders in our study population (17.0%) was lower than rheumatic disorders prevalence in rural areas (24.8%) and urban slums (22.6%) in Bangladesh.[20] Although COPCORD studies have standard design, different definitions of positive respondents were used, thus influencing the prevalence of some rheumatic disorders. A salient finding in our study was a high prevalence (1.0%) of rheumatoid arthritis (RA). In most studies, prevalence of rheumatoid arthritis did not reach the classic 1%. In fact, the prevalence of RA in our study may have been over-estimated because laboratory tests and X-rays were not performed compared to the study in Antalya, which used laboratory investigations. Also, scientific evidence showed an association between genetic factors and RA prevalence rates. Differences in HLA-DRB1 alleles, which are associated with RA, contribute to differences in clinical manifestations and disease severity in several populations.[24] This deserves further attention and confirmation in other study designs.

Despite the fact that the study data cannot be extrapolated to the overall Lebanese population, our findings show that MSK pain is highly prevalent and rheumatic disorders are common in southern Lebanon and higher than what is reported in other neighbouring countries. The high prevalence of musculoskeletal conditions deserves attention from local public health authorities and health professionals to allocate both human and monetary resources for treatment and awareness-building. Recently, some steps have been taken in the light of the findings of our study. For example, a recent awareness campaign on rheumatoid arthritis has been launched by the Ministry of Public Health to educate people about this disease and to push them to seek treatment at an early stage. Also, efforts are being implemented to establish a registry for rheumatoid arthritis. This will serve in constructing baseline data of a cohort of participants to unveil personal and environmental risk factors of this disabling disease.

The source and type of treatment sought by those who reported musculoskeletal pain is a cause for concern. Many sufferers from musculoskeletal pain do not seek treatment until their state becomes severe, and a sizeable proportion consults a general practitioner. This necessitates raising public awareness about MSK and training general practitioners in rheumatology to manage these conditions and refer them to rheumatologists when necessary.

Finally, the results of our study lobby and advocate for the exchange of information to

understand disparities and most importantly to support and enhance networking for improving musculoskeletal health.

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