



Musculoskeletal Disorders in Male and Female Patients and Related Factors

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Authors' contributions

This work was carried out in collaboration between all authors. Author SBG designed the study, performed the statistical analysis and wrote the first and last version of the manuscript. Authors MI, ZE-SH and RB managed the literature searches, analyses of the study and wrote the diverse versions of the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Aim: The aim of the study is to find differences and factors associated to musculoskeletal disorders in male and female patients in primary health care units in Egypt.

Subjects and Methods: This is an exploratory cross-sectional study of a sample of 396 patients with musculoskeletal disorders- 44.7% men and 55.3% women - in primary health care settings in a rural and urban area. Aside from demographic characteristics, the questionnaires included the modified Nordic Musculoskeletal disorders (MSDs) items, duration of disease, family history, physical activities, effect of MSD on life, other diseases and an abbreviated depression score. Male and female patients were compared in the analysis. Chi-square, t-test, ANOVA were used as significance tests.

Results: The primary MSD for men (36%) and women (40%) is back pain. The age of female patients with back pain was 8.4 years younger ($p=0.001$) than that of male patients. Women with

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neck pain were 15.9 years ($p=0.001$) younger than the men and those with a rheumatic disorder, 18.8 years ($p=0.02$). Factors related to MSDs in men are accidents, strenuous work and smoking; while factors for women are hormonal medication, family history of MSDs and less physical activities. There was no difference between men and women as regards the depression scores for each MSD.

Conclusion: Female patients suffer from musculoskeletal diseases at a significantly younger age than male patients. Both genders have different risk factors associated with MSDs. Depression scores for MSDs are low.

Keywords: Gender; depression; back pain; primary health care; developing country.

1. INTRODUCTION

Musculoskeletal disorders (MSDs) are neglected diseases with different pain levels which can lead to physical impairment or disability. They affect millions of people worldwide and are expected to rise globally. This is due to a combination of greater life expectancy with the higher risk of road accidents in developing countries. A group of health professionals declared 2000-2010 as the Bone and Joint decade [1]. The Burden of Disease Study 2010 estimated that MSDs cause 21% of all years with disability worldwide [2].

Aside from strenuous work, lifestyle factors such as obesity, smoking, lack of physical activity [3], reproductive and hormonal factors, as well as increased estrogen levels, are related to chronic MSD [4]. Abdulbari et al. [3] indicated that back pain was an important cause for seeking health care. Though back pain is the most prevalent MSD and the second leading cause of sick leave, osteoarthritis is anticipated to be the fourth leading cause of disability by the year 2020 [2]. Pain related to MSD is one of the main reasons for accessing primary health care (PHC). A significant amount of research addresses MSDs in relation to working conditions, [5,6] however not much addresses patients accessing PHC. This is concerning as Parsons et al. [7] found that the mean prevalence of MSDs was 38% in family practice. The research question raised was whether there are gender differences in MSD. The aim of the study is to find differences and factors associated to musculoskeletal disorders in male and female patients in an urban and a rural primary health care unit in Egypt.

2. SUBJECTS AND METHODS

An exploratory cross-sectional study was conducted on a sample of 396 MSD patients diagnosed by primary health care (PHC) physicians; 177 were men (44.7%) and 219 were women (55.3%). All patients who visited the PHC

unit were in pain or had movement restriction. Of these, 75% of them took some form of medication regularly and 25% only when necessary. Two-thirds of the patients had previously been to the primary health care unit for MSDs. The study was conducted in two primary health care units, one in Cairo (181) and one in rural Qaliubiya (215) twice a week for six months. The first step in the survey was the translation of the Nordic MSD questionnaire [8] into Egyptian Arabic. This was then followed by a pilot study involving 14 patients to make relevant adjustments and modifications before the start of the survey. The test-retest reliability was $r=0.69$.

All patients present on that day with MSD - whether educated or uneducated - became part of the survey provided they consented to be interviewed. The researchers explained to the patients the purpose of the study, their voluntary participation and the anonymity of the information provided. With the patient's oral informed consent, a personal interview in Egyptian was conducted and the questionnaire filled out. Patients with MSD complaints of at least one year were included. Exclusion criteria were:

- Patients below the age of 15 years
- Currently pregnancy
- Persons who were recently in a car accident

Diagnosed:-

- Muscular dystrophy
- Autoimmune diseases
- Vascular diseases
- Neurological diseases
- Mental illnesses
- Congenital skeletal anomalies

Aside from demographic characteristics, the study questionnaire also included the following:

1. Onset and duration of illness, family history of MSDs, accidents, surgery,

previous visits to a physician or a specialist, physical activities, lifting of heavy objects, impact of MSDs on activities of daily living.

2. Modified Nordic MSDs questionnaire (1987) [8] which includes MSD type and information about pain in the neck and joints, lower extremity - mainly of the knees - and shoulders. Upper and lower back pain and history of chronic MSD conditions was also recorded.
3. Abbreviated depression score according to Abdel Halim Mahmoud Al-Said (1993) [9] with six items (0 -18) comprising the following:
 - Overwhelming problems and burdens
 - Bored / cannot stand somebody talking
 - Unhappiness and sadness without any obvious reason
 - No self-satisfaction
 - Urge to cry
 - Disappointment

Each item had a minimum score of "0" and a maximum of "3". The total score was 0 – 18 with $r = 0.76$.

The weight and height and hemoglobin of the patients were given to the research team by the physician. These were measured with a standard medical balance beam scale with a rigid vertical height rod (Detecto). Their Body Mass Index was calculated based on the WHO's classification (2004) [10].

The ethical committee of the Community and Industrial Medicine Department approved the research.

The statistical analysis was performed with SPSS version 12 using the 0.05 level of significance. Patients were stratified according to gender. Aside from descriptive statistics, t-test was used to compare mean age, depression score, BMI and duration of MSD complaint between men and women. ANOVA was used to compare mean ages or mean depression scores of MSDs in men and in women. Chi-square test (chi-sq) was also conducted for qualitative variables such as residence, education, factors contributing to MSDs, and lifestyle factors.

3. RESULTS

The characteristics of male and female patients with musculoskeletal disorders (MSD) are shown

in Table 1. No significant difference was found between genders as regards residence and duration of MSD. Men had significantly more formal education. Female patients were significantly younger in age than male patients ($p=0.001$) and had significantly higher BMIs ($p=0.001$).

Around 85% of men and 79% of women were married with no significant difference between them ($p=0.1$); 60% of women had had one or more pregnancy.

Fig. 1 shows the distribution of MSDs in men and women. Back pain is the most prevalent complaint for men (36.2%) and women (40%). There is a significant difference between male and female patients regarding all MSDs (Chi-sq=24.7, $p=0.001$). Significantly more women had disorders in their lower extremities (knee) than men, while more men had sport injuries. Women (42.5%) are much more prone to have multiple MSD complaints than men (31.1%) ($p=0.02$).

Table 2 illustrates the mean age of male and female patients for each MSD. The mean age of the female patients with back pain ($p=0.001$), neck pain ($p=0.001$) and rheumatic disorders ($p=0.02$) was consistently younger than that of the male patients with the same issues. Female patients with back pain were 8.4 years younger than male patients. Women with neck pain were 15.9 years younger and those with a rheumatic disorder were 18.8 years younger. Sports injuries were more prevalent in younger men. Both genders suffer from chronic inflammatory osteoarthritis at an older age than other MSDs.

As factors contributing to musculoskeletal disorders, significantly more men than women were found to undergo strenuous work ($p=0.049$) and had past history of accidents ($p=0.039$). While women had a greater family history of MSDs ($p=0.016$), hormonal therapy ($p=0.001$) and anemia ($p=0.001$) (Table 3).

Table 4 shows no difference between genders regarding walking. However, significantly more men undertake a weekly physical activity ($p=0.001$) (Fig. 2) and 22% of them smoke (Fig. 3). Around two-thirds of men and women stated that MSD affects their life. No difference was found between both genders regarding the consumption of milk and milk products.

Table 1. Characteristics of musculoskeletal disorders (MSD) in patients by gender

Variable	Male patients		Female patients		Significance test p value
	N=177	100%	N=219	100%	
Visit to PHC					
First time	60	34.5	71	32.7	Chi-sq=1.4 p= 0.49
More than once	114	65.5	146	67.3	
Residence					
Urban	80	45.2	101	46.1	Chi-sq=0.04 p= 0.9
Rural	97	54.8	118	53.9	
Education					
Uneducated	61	34.5	122	55.7	Chi-sq=17.7 p= 0.001*
Formal education	116	65.5	97	44.3	
Age in years					
15 -19	16	9.0	10	4.6	Chi-sq=39.9 p= 0.001*
20- 29	23	13.0	78	35.6	
30-39	35	19.8	23	10.5	
40-49	22	12.4	45	20.5	
50-59	36	20.3	28	12.8	
60+	45	25.4	35	16.0	
Mean age \pm SD (15-82 years)	45.2 \pm 17.9		39.4 \pm 18.2		t=3.2 p=0.001*
BMI	26.5 \pm 4.6		28.5 \pm 7.6		t=3.09 p=0.001*
Duration of MSDs (year)	7.4 \pm 0		7.5 \pm 0		t=0.18 p=0.86

*significant

Table 2. Mean age of musculoskeletal disorders in males and females patients

Musculoskeletal disorders	Male patients Mean age \pm SD	Female patients Mean age \pm SD	t-test
Back pain	49.3 \pm 16.4	40.9 \pm 17.2	t=3.04 p=0.001*
Lower extremity (mainly knees)	49.7 \pm 19.1	42.1 \pm 19.1	t=1.7 p=0.08
Neck pain	44.7 \pm 14.7	28.8 \pm 14.0	t=3.4 p=0.001*
Shoulder	41.0 \pm 17.1	31.1 \pm 15.9	t=1.8 p=0.07
Rheumatic disorders	51.9 \pm 19.8	33.1 \pm 16.8	t=2.56 p=0.02*
Chronic inflammation / osteo-arthritis	53.3 \pm 15.8	47.7 \pm 18.6	t=0.7 p=0.46
Sport injury	25.4 \pm 8.5	26.0 \pm 1.4	na
Repetitive strain injury	26.7 \pm 9.6	46.3 \pm 26.2	na
Others	60.0	---	na
	ANOVA F=5.8 p=0.001*	ANOVA F=2.8 p=0.006*	

*significant

Significantly more women than men had higher total depression scores (p=0.01). However, when it comes to each MSD no score difference was found between the genders (Table 5).

4. DISCUSSION

Our finding revealed that more female (55%) than male patients visited the primary health care (PHC) unit for musculoskeletal disorders. A

similar finding was made by Kinge et al. [11] in Norway where, likewise, more women than men visited the PHC services for MSDs. Pain related MSDs start early in life; 54.3% of male and 71.2% female MSD patients were less than 50 years old. In the Disability-Health Survey in France, Palazzo et al. [12] found that some MSD complaints even started in childhood. Our findings revealed that the average age of female patients with MSDs was significantly younger

than that of male patients. However, there is no significant difference between genders regarding the mean duration of the ailment. Parsons et al. [7] study in family practices stated that the

likelihood of MSDs increases with age and its prevalence is expected to continue to rise due to the ageing population and sedentary lifestyles.

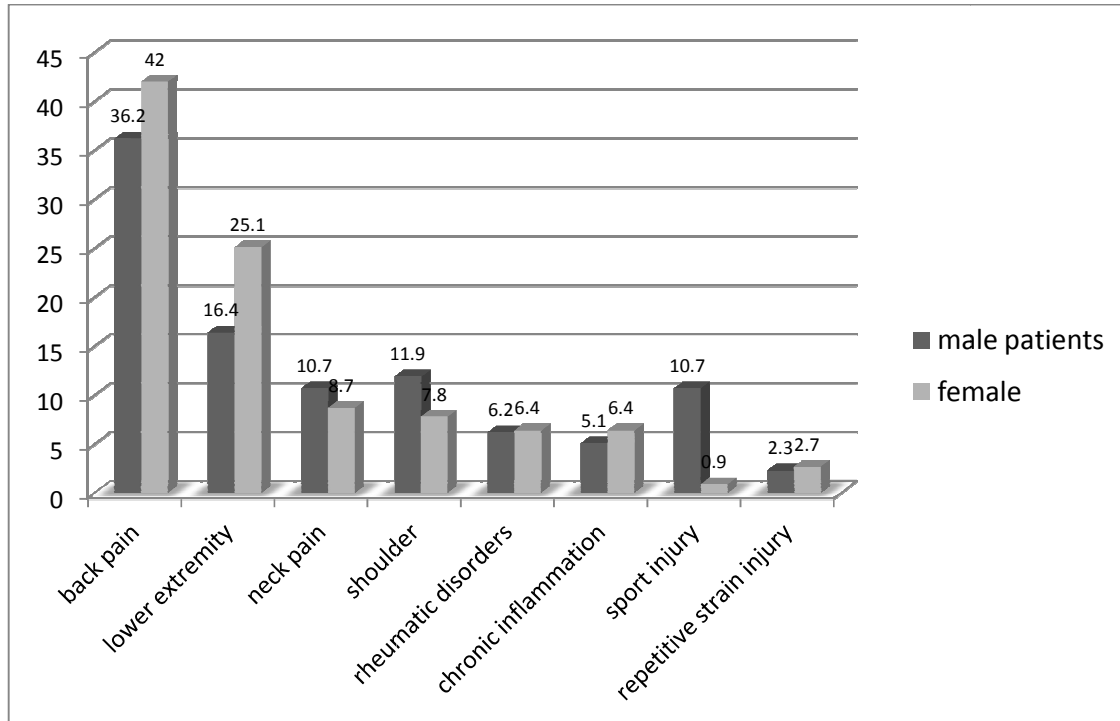


Fig. 1. Distribution of MSD types in male and female patients

Table 3. Factors contributing to musculoskeletal disorders in men and women

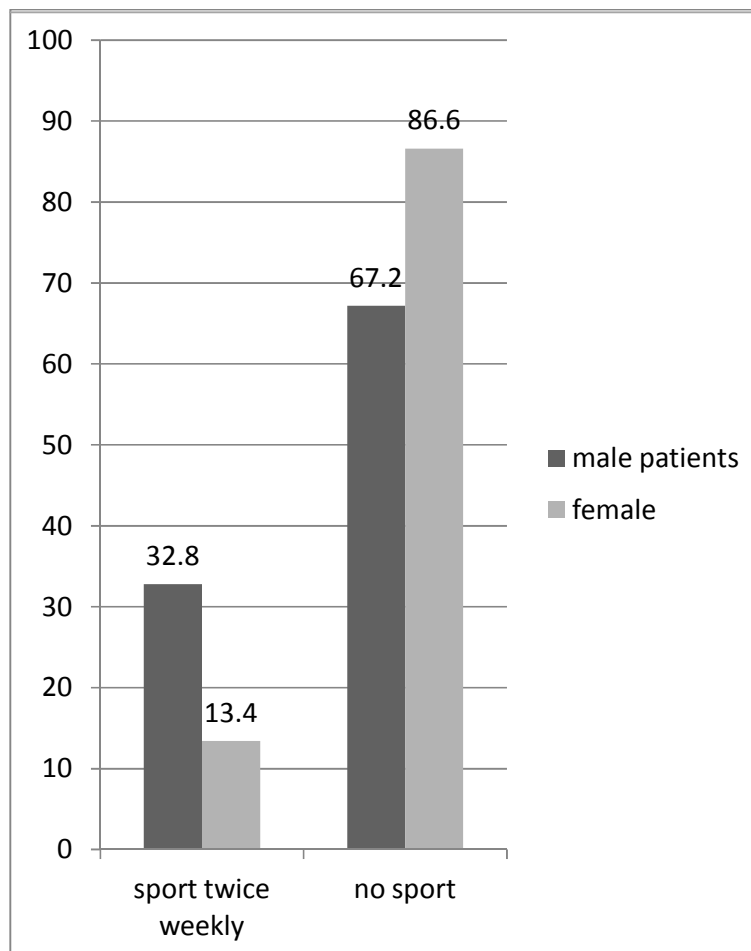
Variables	Men		Women		Test of significance
	N	100%	N	100%	
Family history of musculoskeletal disorder					
None	84	49.1	76	35.5	Chi-sq= 10.26 p=0.016*
Parents	44	26.1	81	37.9	
Siblings	30	17.8	35	26.4	
Other relatives	11	6.5	22	10.3	
Strenuous work					
Yes	38	21.7	31	14.1	Chi-sq= 3.85 p=0.049*
No	137	78.3	188	85.9	
Accidents					
Yes	42	23.9	34	15.6	Chi-sq= 4.27 p=0.039*
No	134	76.1	184	84.4	
Hormonal therapy					
Yes	10	5.7	36	16.5	Chi-sq= 10.95 p=0.001*
No	165	94.3	182	83.5	
Anemic					
Yes	10	17.7	87	40.1	Chi-sq= 23.05 p=0.001*
No	144	82.3	130	59.9	

*significant

Table 4. Some lifestyle factors among male and female patients with musculoskeletal disorders (MSDs)

Variables	Male patients		Female		Test of significance
	N	100%	N	100%	
Twice weekly sport activity					
Yes	58	32.8%	29	13.4	Chi-sq = 23.2 p=0.001*
No	119	67.2%	188	86.6	
Walking					
Daily	50	28.2%	65	29.7	Chi-sq = 2.15 p=0.5
2-3 times weekly	19	10.7%	32	14.6	
less	106	59.9%	118	53.9	
no	2	1.1%	4	1.8	
Smoking					
No	82	47.1	216	98.6	
Ex-smoker	53	30.5	1	0.5	
Smoker	39	22.4	2	0.9	
Effect of MSD on their life					
Yes	110	63.2	141	65.3	Chi-sq = 0.18 p=0.67
No	64	36.8	75	34.7	

*significant

**Fig. 2. Bi-weekly sport activities of male and female patients**

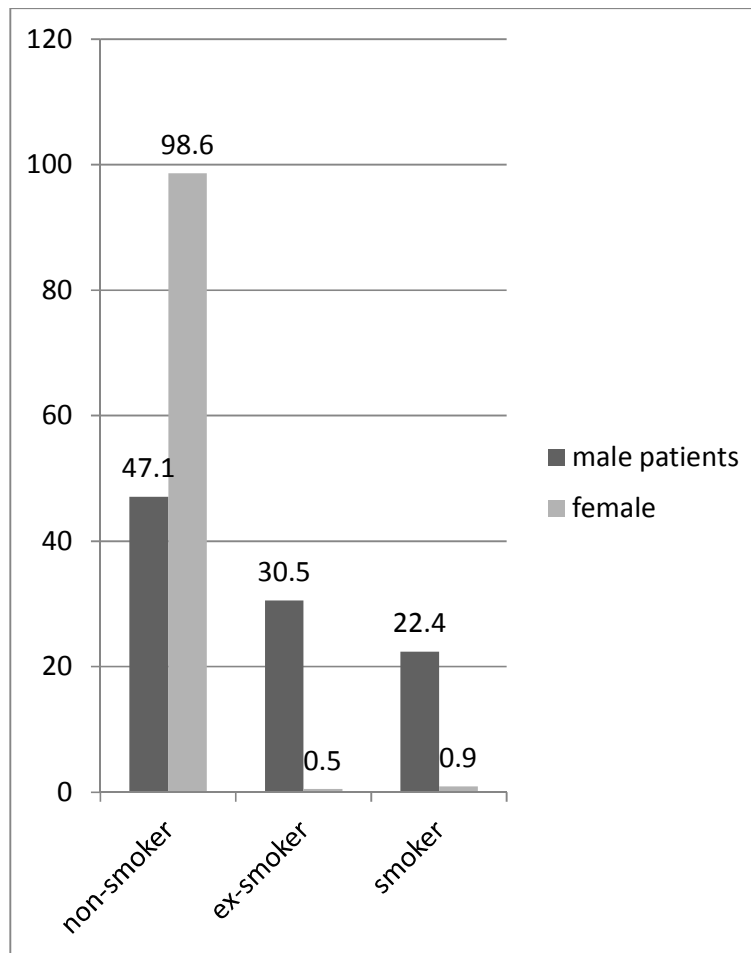


Fig. 3. Smokers in male and female patients

In our study, the most common complaints reported by both genders were back pain and, at a close second, pain in the lower extremities, mainly in the knees. Following that, the most common problems were neck pain, shoulder and rheumatic ailments. In South Iran, Sandoughi et al. [13] found that knee and then back pain were the most common complaints which differ regarding the sequence in our study, but both ailments are the main disorders like ours. In their study in primary health care centers in Crete, Antonopoulou et al. [14] found a similar sequence of MSD complaints, however, knee problems came in fourth and not second as was the case in our findings. While in France, osteoarthritis was the most prevalent MSD ailment [12].

Although Abdelbari et al. [3] mentioned that back pain was more prevalent in women than in men

in their study in a primary health care setting in Qatar, our research found no difference between women and men as regards back pain. Aside from the difference in lower extremity complaints (knee) where more women than men have the disorder, we did not find significant differences between both genders in any MSD. However, our research noticed that women with back pain, neck pain and rheumatic disorders are significantly younger than men with the same issues. This is most likely due to the fact that on average their BMI was significantly higher than that of men and only 13% of women were physically active. Woolf et al. [15] indicated that obesity and lack of physical activities, combined with other lifestyle factors, increases the prevalence of MSDs. More women underwent hormonal therapy than men. In addition, over 60% of women had pregnancies. Around 63% of both genders had no other diseases.

Table 5. Mean depression score in musculoskeletal disorders in male and female patients

Musculoskeletal disorders	Males(177) Mean depression score±SD	Females (219) Mean depression score±SD	t-test
Total MSDs	6.1±3.9	7.1±4.0	t-test=2.4 p=0.01*
	(N)	(N)	
Back pain	(64) 5.9±3.8	(92) 6.8±4.0	t=1.3 p=0.18
Lower extremity (mainly knees)	(29) 6.8±4.2	(55) 7.0±3.7	t=1.7 p=0.86
Neck pain	(19) 6.2±3.9	(19) 8.6±4.2	t=1.85 p=0.07
Shoulder	(21) 4.5±2.7	(17) 7.0±4.6	t=1.96 p=0.058
Rheumatic disorders	(11) 7.6±4.1	(14) 5.7±4.4	t=1.4 p=0.17
Chronic inflammation/ osteo-arthritis	(9) 4.8±4.2	(14) 8.5±4.4	t=2.02 p=0.056
Sport injury	(19) 6.3±4.1	(2) 5.5±0.7	na
Repetitive strain injury	(4) 8.2±5.8	(6) 9.2±3.1	na
Others	(1) 4.0	--	na
	ANOVA F=1.1 p=0.4	ANOVA F=1.2 p=0.3	

*significant

Factors contributing to MSDs in men in this study were strenuous work, accidents, and smoking. Palmer et al. [16] found that smoking had an association with MSDs. Since the numbers regarding strenuous work related to osteoarthritis were small in this study, it was not possible to verify the association between them as Richmond et al. [17] indicated in the systematic review.

This study indicated that depression scores in general are low without substantial difference between genders. Women have significantly higher scores than men for the total MSDs. In contrast, Phymauung et al. [18] systematic review study found that depression plays a significant role in knee pain. It is likely that patients in Egypt accept their ailments as their "fate" despite the fact that around 65% of both genders stated that MSD had an effect on their life. In their research Wiitavaara B et al. [19] found that both genders have a holistic definition of health comprising "body and soul, prognosis, character of symptoms, physical and social activity, and emotional state" and that diverse cultures experience illness differently. Baggio et al. [20] stress on "the urgency of basic science and clinical research to increase our understanding of the gender differences of diseases".

5. CONCLUSION

Many MSDs start at a younger age. Female patients are significantly more affected at a younger age than male patients. On average, women with back pain were 8.4 years younger than men. Those with neck pain were 15.9 years younger and the ones with a rheumatic disorder 18.8 years younger. Chronic inflammatory osteoarthritis is more common at an older age. Strenuous work, accidents and smoking are risk factors for MSDs in men, while family history of MSDs, hormonal therapy and less physical activities are factors contributing to MSDs in women. Depression scores for both genders were comparatively lower than those in other MSD studies.

6. LIMITATION OF THE STUDY

This primary health care based study does not include those who medicate themselves over the counter without consulting a physician. The study also does not include patients visiting private clinics or outpatient clinics in hospitals, some of whom may be experiencing more pain.

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ETHICAL APPROVAL

The Ethical Committee of the Faculty of Medicine (Girls) approved this research.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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