



Determinants of Health-related Quality of Life in Older People with Chronic Musculoskeletal Pain in Hong Kong: A Cross-sectional Study

Hugo P.Y. FONG^{1,2}, Shirley Y.K. CHOI², Maria K.W. LEUNG², Regina W.S. SIT¹

¹ The Jockey Club School of Public Health and Primary Care, the Chinese University of Hong Kong, Hong Kong

² Department of Family Medicine, the New Territories East Cluster, Hospital Authority

Introduction

Background of the study

Chronic musculoskeletal (MSK) pain has a substantial impact on the overall well-being of individuals by causing physical, psychological, and social limitations, which significantly affect their health-related quality of life (HRQoL).

Considering the increasing prevalence of chronic MSK pain and its detrimental effects, it is crucial to understand its impact on the HRQoL of older individuals and the associated determinants.

Aims of the study

- To evaluate the EQ-5D-5L, a widely used generic tool to measure HRQoL,¹ among community-dwelling Chinese older people with chronic MSK pain
- To identify the significant physical and psychosocial determinants associated with EQ-5D and its individual dimension

Methods

Participants and recruitment

From March 2019 to November 2021, 1072 participants (aged ≥ 60 years old, with chronic musculoskeletal pain ≥ 3 months) were recruited through community channels such as press conferences, television and radio programs, social media, and digital platforms such as websites and Facebook.

Data measurement

(i) Independent variables (determinants)

	Physical	Psychosocial
Continuous	<ul style="list-style-type: none"> Age Number of pain sites Number of comorbidities 	<ul style="list-style-type: none"> Depression level (PHQ-9 scores) Anxiety level (GAD-7 scores)
Categorical	<ul style="list-style-type: none"> Gender (Male/ Female) Most painful site (Neck/ Shoulder/ Back Knee/ Ankle and foot) 	<ul style="list-style-type: none"> Living environment (Living alone/ Live with family) Social allowance status (Yes/ No)

(ii) Dependent variables

- EQ-5D-5L index score ("full health" index score = 1.0)
- EQ-5D-5L five dimensions scores: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression (dimension score = 1: "no problems"; score > 1: "having problems")

Statistical analysis

- Descriptive statistics
- Binary multivariate logistic regression were used to evaluate the odds ratio of whether a participant reported "having problems" in each EQ-5D dimension across different subgroups.
- Multiple linear regression by Ordinal least squares (OLS) model were used to study the relationship between EQ-5D-5L index score and different continuous and categorical independent variables.

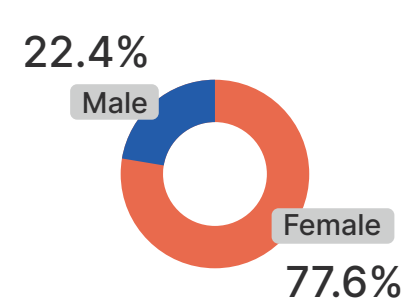
Results

HRQoL of older Chinese individuals with chronic MSK pain using EQ-5D-5L HK:

0.7 (SD=0.22)
Mean EQ-5D index score of the sample

N = 1072

67 (SD=5.1)
The participants' mean age



Association between HRQoL and relevant physical and psychosocial variables:

- Binary multivariate logistic regression: Participants with higher PHQ-9 scores were more likely to report "having problems" in most EQ-5D dimensions (Table 1).

Table 1 Binary multivariate logistic regression

		EQ-5D 1 Mobility	EQ-5D 2 Self-care	EQ-5D 3 Usual activities	EQ-5D 4 Pain/Discomfort	EQ-5D 5 Anxiety/ Depression
Continuous variables						
Age		1.01	1	0.97	0.94*	0.97
Number of comorbidities		0.96	0.96	0.95	0.98	1.11***
Number of pain sites		1.06	1.06	1.06	1.23*	1.06
PHQ-9		1.09***	1.07**	1.09***	1.03	1.09***
GAD-7		1.06**	1.01	1.03	1.12**	1.26***
Categorical variables						
Gender (ref: Male)	Female	0.91	0.77	1.15	0.96	0.85
Most painful site (ref: Shoulder)	Ankle and foot	4.65***	0.29**	0.85	1.14	0.84
	Back	2.67***	0.47**	1.49	1.35	0.91
	Knee	5.56***	0.64	1.99**	1.16	0.78
	Neck	1.52	0.52	1.31	2.31E+06	0.69
Living environment (ref: Living with family)	Living alone	1.2	0.95	1.11	0.98	1.15
Social allowance status (ref: Having allowance)	No allowance	1.29	1.22	0.99	0.9	0.91

*p < 0.05 **p < 0.01 ***p < 0.001

Multiple linear regression by OLS:

- Higher PHQ-9 scores ($\beta = -0.009, P < 0.001$) (Fig. 1A), higher GAD-7 scores ($\beta = -0.013, P < 0.001$) (Fig. 1B), and larger number of pain sites ($\beta = -0.006, P = 0.047$) (Fig. 1C) were associated with lower EQ-5D index scores (Fig. 1D).

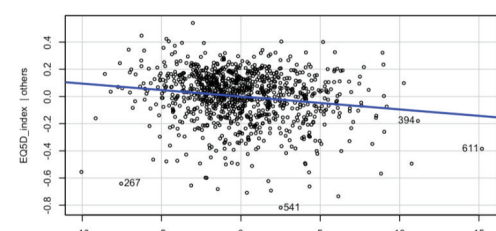


Fig. 1A Partial regression graph of PHQ-9 score vs EQ-5D index score

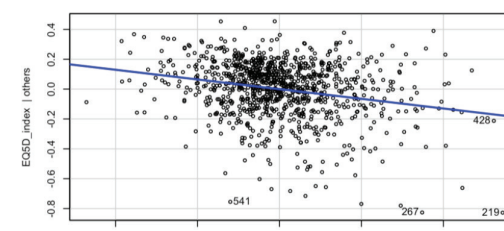


Fig. 1B Partial regression graph of GAD-7 score vs EQ-5D index score

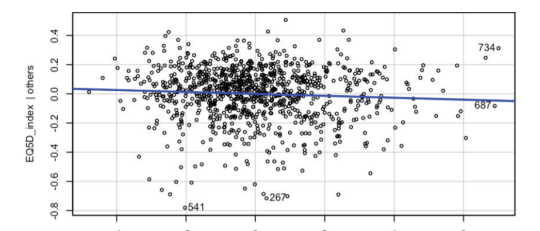
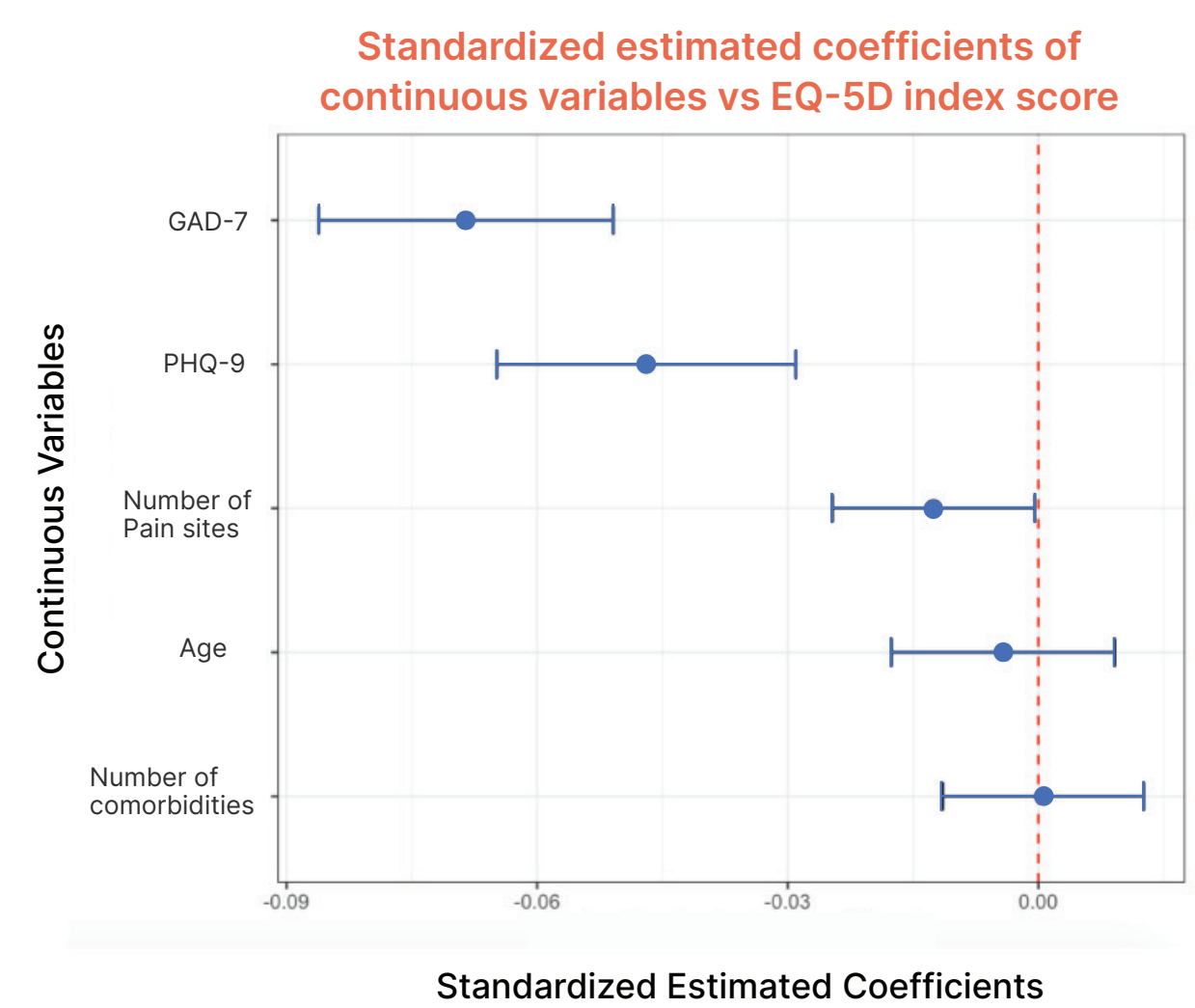


Fig. 1C Partial regression graph of number of pain sites vs EQ-5D index score

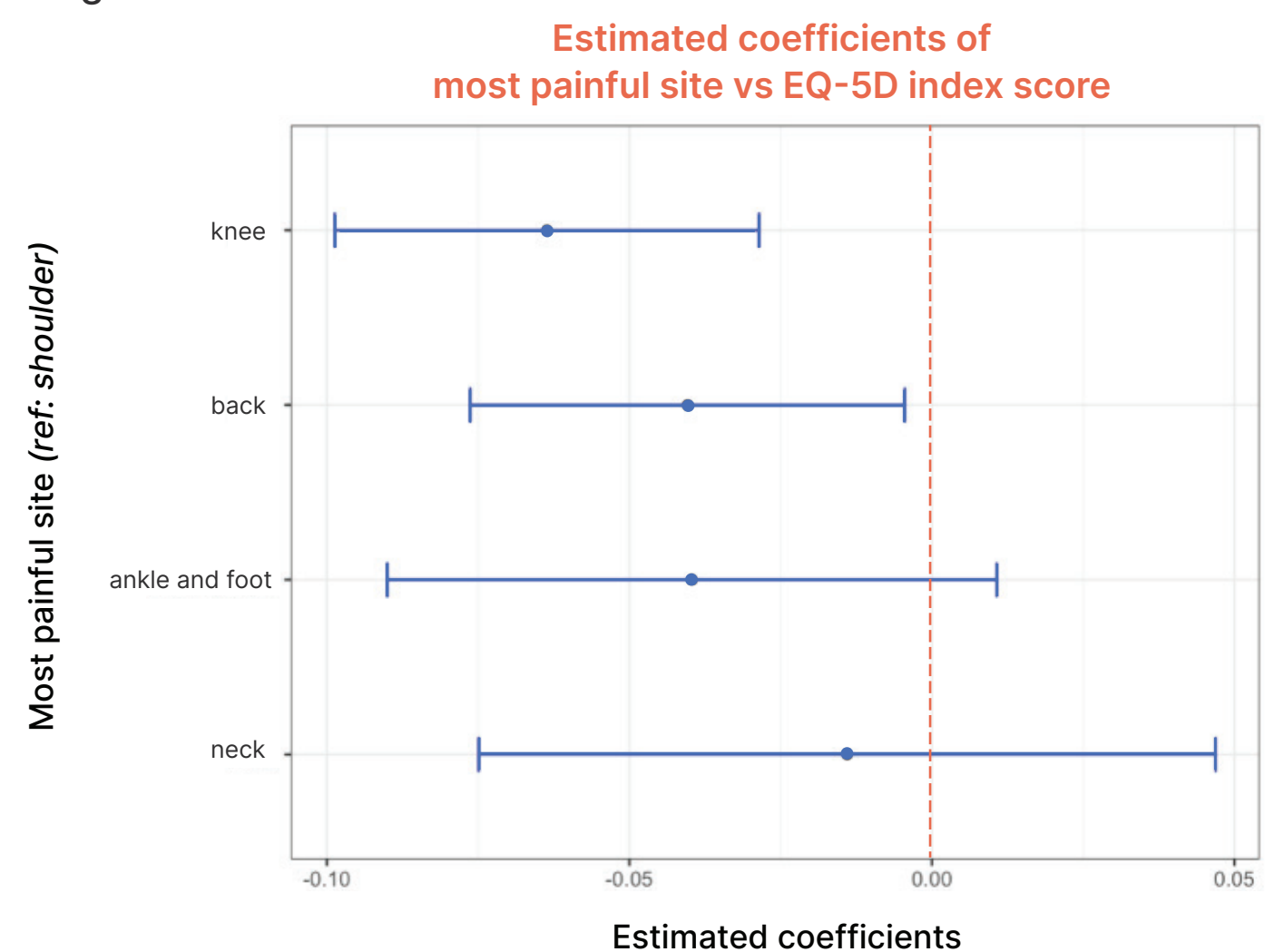
Fig. 1D Standardized estimated coefficients of continuous variables vs EQ-5D index score



- Regarding the most painful site, back ($\beta = -0.043, P = 0.019$) and knee ($\beta = -0.065, P < 0.001$) were significantly associated with lower EQ-5D index scores (Fig. 2).

Fig. 2

Estimated coefficients of most painful site vs EQ-5D index score



Discussion

Clinical implications

- The emerging demand for additional resource allocation for psychological determinants (higher anxiety or depression levels), considering their impact on the overall EQ5D index score and individual dimensions of EQ5D.
- The need to prioritize resources for other identified determinants, such as knee or back as the most painful site, as well as a larger number of pain sites.
- The importance of adopting a holistic biopsychosocial approach to optimize HRQoL in elderly individuals with chronic MSK pain.

Strengths

- First-of-its-kind study
- Provided robust reference of EQ-5D-5L HK Chinese version of the targeted population with a sample size of 1072

Limitations

- Potential selection bias: Might have excluded individuals with more severe pain and mobility limitations

Conclusion

- Mean EQ-5D index score of 0.7 among older adults with chronic MSK pain, notably lower than the score of 0.92 of Hong Kong general population²
- Higher depression or anxiety levels, larger number of pain sites, knee or back as maximal painful site are significant determinants for worse HRQoL among the targeted population
- Prioritized resources allocation in addressing these determinants to optimize the overall HRQoL

Reference:

- Herdman, M., Gudex, C., Lloyd, A., et al. (2011). Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). Quality of Life Research, 20, 1727-1736
- Wong, E. L. Y., Cheung, A. W. L., Wong, A. Y. K., et al. (2019). Normative profile of health-related quality of life for Hong Kong general population using preference-based instrument EQ-5D-5L. Value in Health, 22, 916-924.