

## Pain Characteristics and Quality of Life in Older People at High Risk of Future Hospitalization

### Supplemental material File 1. Physical activity measures and multiple imputation statistical method.

#### *Physical activity*

Question 1: Respondents were asked about everyday physical activity during the last 6 months, such as walking or bicycling to the store, going out with dogs, gardening, shoveling snow or some other activity likewise (A =no everyday activity, B =activity at some time during the week, C =activity several times a week, D =almost daily or daily activity). Question 2: Respondents were also asked about exercise /sport /open-air activity (not included in the everyday life activities above). The answer alternatives were A) no activity, B) very little activity, C) mild form (soft) of activities such as walking at least once per week, D) more strenuous activities such as jogging, swimming, or gymnastics at least once per week, E) hard activities which demand great physical exertion and with regularity. A combination of the answers to both questions generated the physical activity level 1-4 (table 1).<sup>1,2</sup>

#### *Multiple imputation*

Missing data are often categorized into the following three types: missing completely at random (MCAR), missing at random (MAR), and missing not at random (MNAR).<sup>3</sup> Traditional statistical analysis such as linear regression is based on the assumption of MCAR. However, most clinical epidemiological research is neither MCAR nor MNAR but MAR.<sup>4</sup> Multiple imputation (MI) can be used to handle missing data under the MAR assumption, with a purpose of providing unbiased and valid estimates of associations based on information from the available data.<sup>3,5</sup> As described by Harel et al, MI consisted of 3 steps: data imputation (i.e. multiple imputation by chained equations (MICE)), analysis of each imputed data set (i.e. linear regression) and a final estimate of coefficients in the combination of all the imputed data sets (pooled).<sup>5</sup>

Before multiple imputation, we performed the analysis of missing data patterns. Table 2 showed number of missing cases in each variable of interest. A total of 1390 values (8.4%) were missing and 581 (70.4%) of the 825 cases contained at least one missing value.

Multiple imputation was applied using  $m = 100$  (iterations =50) imputed data set with predictive mean matching method and included all the variables of interest (predictors and outcomes). Several arguments and suggestions on the number of imputations have been discussed previously.<sup>4,6,7</sup> Using the pooled sample, we found that our models did not in fact change much as a result of imputing missing data. As shown in table 3, there were similar significant associations of all the domains of QoL with pain characteristics in comparison to the original data. However, the estimates' standard errors were slightly lower when missing cases were considered in the regression models.

#### **References:**

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### Supplementary File 2. Table S1-S3.

**Supplementary Table S1.** Physical activity level generated by two questions.

Question 1 \ Question 2	A	B	C	D
A	1	1	2	3
B	1	2	2	3
C	2	2	2	3
D	3	3	3	4
E	4	4	4	4

**Supplementary Table S2.** Missing cases in each variable.

	Missing N (%)	Valid N
Pain duration	263 (31.9)	562
Physical activity level	246 (29.8)	579
SWLS scales	168 (20.4)	657
VAS Pain-7d	121 (14.7)	704
Frequency of feeling lonely	105 (12.7)	720
Frequency of feeling worried	100 (12.1)	725
PGCMS-subcales	80 (9.7)	745
EQ-5D index	70 (8.5)	755
Number of close relationships	59 (7.2)	766
Pain frequency	43 (5.2)	782
Education level	28 (3.4)	797
Number of used assistive technology	24 (2.9)	801
RAND-36 <sup>PF</sup>	23 (2.8)	802
Having relatives nearby	22 (2.7)	803
ADL-staircase	18 (2.2)	807
Living situations	11 (1.3)	814
Housing	9 (1.1)	816

SWLS: Satisfaction with life scale; VAS: visual analog scale; PGCMS: Philadelphia Geriatric Center Morale Scale; PF: physical functioning; ADL: Activity of Daily Living.

**Supplementary Table S3.** Association between Quality of Life and pain characteristics.

IV \ DV	EQ-5D index	Rand-36 <sup>PF</sup>	PGCMS-subscale	SWLS
VAS Pain-7d	-.002 (.0004) <sup>c</sup>	-.09(.04) <sup>a</sup>	-.003 (.002)	0.001 (0.01)
Pain frequency	-.05 (.01) <sup>c</sup>	-1.58 (.94) <sup>a</sup>	-.005 (.06)	-0.58 (0.21) <sup>b</sup>
Pain extent	-.005 (.001) <sup>c</sup>	-.07 (0.11)	-.02 (0.01) <sup>b</sup>	.02 (.02)
Pain duration	-.0004 (.0003)	-.04 (.03)	.003 (.002)	.003 (.007)

<sup>a</sup> p<.05, <sup>b</sup> p<.01, <sup>c</sup> p<.001. SWLS: Satisfaction with life scale; VAS: visual analog scale; PGCMS: Philadelphia Geriatric Center Morale Scale; PF: physical functioning.

Coefficients (standard error). IV: independent variables, DV dependent variables. Adjusted for sociodemographic (age, gender, education level, living situation and housing), functional status (number of used assistive technology, physical activity level, ADL-staircase) and social network (relatives living closely, number of important persons, frequency of feeling lonely and worried).

**Supplementary File 3. Figure S1.**

**Fig 1.** Flow chart outline the inclusion of participants for this study.

