

# Low health-related quality of life, greater psychological distress and productivity loss: The personal burden of shoulder pain among younger people

Ilana N Ackerman, Kathy Fotis, Lauren Pearson, Peter Schoch, Nigel Broughton, Sharon Brennan-Olsen, Andrew Bucknill, Tom Treseder, Emily Cross, Nicola Bunting-Frame and Richard S Page

Email: [ilana.ackerman@monash.edu](mailto:ilana.ackerman@monash.edu) : [Richard.page@deakin.edu.au](mailto:Richard.page@deakin.edu.au)

## Background

Musculoskeletal conditions can have a profound impact on younger people, who often need to manage ongoing pain and physical impairments alongside employment, recreation, and family roles. Although shoulder pain can develop across the lifespan, people of working age are particularly susceptible given work-related upper limb use and sports injuries. Painful shoulder conditions are the third most common musculoskeletal reason for which Australians consult a general practitioner, after back and knee complaints. While many studies have examined outcomes of shoulder surgery in younger individuals, few have focused on the impacts of living with chronic shoulder pain.

## Aim

This analysis aimed to:

- compare the health-related quality of life (HRQoL) of people aged 20-55 years who have shoulder pain with Australian population norms;
- compare the prevalence of high/very high psychological distress in the sample with Australian population norms; and
- evaluate paid and unpaid work participation and work productivity in this patient group.

## Methods

### Study design

Cross-sectional analysis of baseline data from a prospective, multi-centre cohort study.

### Ethics approval

Ethics approval was obtained from the Barwon Health and Melbourne Health Human Research Ethics Committees, and site-specific approval was obtained from Peninsula Health.

### Participants

Participants were recruited in 2017-2018 from orthopaedic outpatient clinics at three large metropolitan and regional public hospitals in Victoria. Eligible individuals were aged 20-55 years with shoulder pain of >6 weeks' duration related to conditions including but not limited to OA, rotator cuff pathology, capsule pathology, glenohumeral instability, or internal derangement of the glenohumeral or acromioclavicular joints. Participants needed to be fluent in English or have a proxy to assist. Exclusion criteria included: inflammatory arthritis; same-sided fracture of the scapula, humerus or clavicle in the past 12 months; same-sided dislocation of the glenohumeral joint or acromioclavicular joint in the past 3 months; inability to provide informed consent.

### Key outcome measures

- HRQoL: assessed using the AqoL instrument
  - range: -0.04 (worst HRQoL) to 1.00 (full HRQoL)
  - minimum important difference = 0.06 AqoL units
- Psychological distress: assessed using the K10 instrument
  - range: 10 (lowest distress) to 50 (highest distress)
  - K10 score  $\geq 22$  indicates high / very high distress
- Work productivity: assessed using the WPAI instrument
  - quantifies the proportion of time missed from work in the past 7 days due to shoulder pain ('absenteeism')
  - quantifies the proportion of impairment while working due to shoulder pain ('presenteeism')

### Data analysis

AqoL data were compared to overall and age- and sex-matched Australian population norms using one-sample t-tests. K10 scores were compared to overall and sex-matched data for the population aged 18-54 years from the 2017-2018 National Health Survey.

Productivity loss was estimated using absenteeism and presenteeism data for the sample and Australian Bureau of Statistics labour force data on average hourly earnings in 2018 (stratified by occupation category).

## Results

### Participant characteristics

Baseline data were available from 81 participants, reflecting considerable recruitment challenges over a 17-month period. The decision to cease recruitment was made after preliminary analyses indicated adequate statistical power to detect a significant reduction in HRQoL, compared to population norms (addressing the primary aim). Participant characteristics are summarized in **Table 1**.

**Table 1. Participant characteristics**

Characteristic	n=81
Age (years), mean (SD)	45 (8)
Men, n (%)	44 (54)
Diagnosis, n (%)	
Rotator cuff pathology	53 (65)
Internal derangement	10 (13)
Shoulder capsule pathology	7 (9)
Glenohumeral instability	6 (7)
Shoulder osteoarthritis	5 (6)
Other	18 (22)
Duration of shoulder pain, n (%)	
<12 months	24 (30)
>12 months	56 (69)
Education, n (%)	
High school	39 (48)
Trade, technical or university	42 (52)
Married or de facto, n (%)	56 (69)

### Health-related quality of life

On average, study participants demonstrated marked HRQoL impairment. Nearly one-quarter of participants (n=19, 23%) had an AqoL score <0.30, indicating very poor HRQoL. Overall, participants had a large and clinically important reduction in HRQoL when compared with population norms and this was also evident in the sex-specific analyses (**Table 2**).

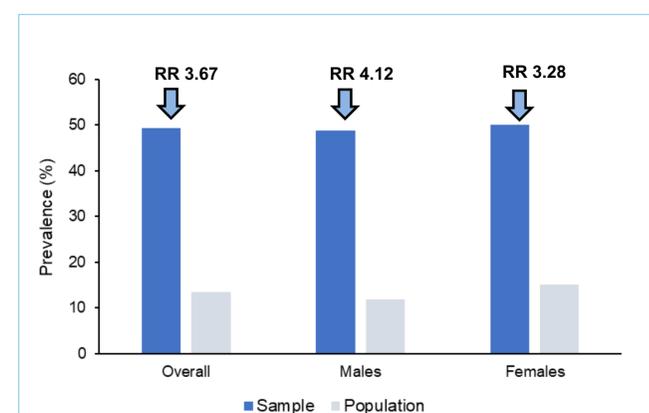
**Table 2. Health-related quality of life for the sample, compared to population norms**

Comparison	n	Mean difference* in AqoL score (95%CI)
Overall sample	79	-0.33 (-0.38 to -0.27)
Population norm	5683	
Males	43	-0.28 (-0.36 to -0.19)
Population norm (males)	2455	
Females	36	-0.36 (-0.43 to -0.28)
Population norm (females)	3165	

\* Negative difference indicates lower HRQoL for the sample compared to population norms

### Psychological distress

As shown in **Figure 1**, high or very high psychological distress was considerably more prevalent among participants than the general population aged 18-54 years.



**Figure 1. Relative risk of high/very high psychological distress**

RR: relative risk for sample, compared to population; all p<0.05

### Shoulder-related work impacts and productivity loss

- Ceased paid employment because of shoulder pain
  - 25% of participants (n=20)
- Unable to do any unpaid work due to shoulder pain
  - 22% of participants (n=18)
- Absenteeism
  - 13% of those in paid employment had missed work in the past 7 days due to shoulder pain
- Presenteeism
  - 73% of those in paid employment reported impairment due to their shoulder while working
  - hours of work lost due to presenteeism: 1.5 - 32 (range)
- Productivity loss in the past 7 days
  - estimated at \$AUD460 for each participant in paid employment

## Take home messages

- This multi-centre study has identified (across a range of wellbeing and work-related indicators) that persistent shoulder pain in younger people is associated with significant personal burden
- This burden includes markedly reduced HRQoL, high levels of distress, reduced workforce participation and for those who remain employed, lost productivity
- As rotator cuff conditions, shoulder capsule pathology, and glenohumeral instability are relatively common, our data suggest that persistent shoulder pain is likely to have a high community impact among people of working age

### Limitations

- This study was designed to span a range of painful shoulder conditions; subgroup analysis by diagnosis was not undertaken
- Cross-sectional analysis provides a valuable snapshot of personal burden but precludes causal inferences

### Funding support

This study was supported by a research grant from the Victorian Orthopaedic Research Trust (VORT).