Patient's outcomes and treatment cost: A Preliminary Study on Back Pain Using ICHOMPatient-Reported Measures in Saudi Arabia

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Background:

Value-based care (VBC) aims to align healthcare outcomes with costs, emphasizing patient-centered metrics.

The International Consortium for Health Outcomes Measurement (ICHOM) provides standardized sets of patient-reported outcome measures (PROMs) to track the effectiveness of interventions, including for low back pain (LBP).

Aim:

This study examines specific PROMs and treatment costs for low back pain in Saudi Arabia, using the LBP standard set from ICHOM obtained from a private insurer.

Methods:

- **Study design and duration:** Retrospective secondary analysis for 97 patients treated for LBP from August 2023 to March 2025.
- **Follow-up timepoints:** 1 month, 3 months, and 6 months.
- **Data sources:** PROMs and cost data.

Outcomes assessed:

  - Functional disability: Oswestry Disability Index (ODI).
  - Pain intensity: Numeric Pain Rating Scale (NPRS) for back and leg pain.
  - Health-related quality of life: EQ-5D-3L.
  - Cost per episode of care.

- **Analysis metrics:** Data completeness and alignment with ICHOM and feasibility indicators for PROMs collection.
- **Statistical analysis:** Descriptive statistics (frequencies, means) and inferential statistics (repeated measures ANOVA and ANCOVA).

Results:

Demographically, (88.7%) of the sample were male. Education levels were varied, with over 30% having tertiary education (Table 1). The mean age of the patients was 50 years (Range 26-79). The higher proportion of severe functional disability at baseline significantly shifted to moderate disability over 6 months (Fig. 1). Pain scores (e.g., back and leg pain) decreased from 8 and 9 at baseline to 1.7 and 1.0, respectively, by month 6 (Fig. 2). Similarly, the EQ-5D-3L scores indicated marked improvement in mobility, self-care, usual activities, pain/discomfort, and anxiety/depression (Fig. 3). The median bundled treatment cost was SAR 53,170, although some cases exceeded SAR 112,542 (Fig. 4). When interacted with time (within-subject effects), educational level showed significant associations with pain scores and quality of life, while body mass index (BMI) was significantly associated with leg pain, and comorbidity status affected quality-of-life outcomes. For between-subject effects, BMI was significantly associated with pain scores and ODI. Similar to the BMI, gender also showed a significant association with ODI. Pairwise comparisons revealed no significant differences beyond the 1-month follow-up for all measured outcomes, except for quality of life (EQ5D-Q06), which continued to improve significantly until the 3-month assessment.

Conclusion:

The implementation of ICHOM's LBP Standard Set is feasible within the Saudi healthcare context, particularly for insured patients. This study shows that using patient-reported outcomes for low back pain in Saudi Arabia is practical and useful. Patients reported less pain and better function over time. However, gaps remain in the collection of comorbidity data and clarity in work return definitions. The cost benchmarking also requires refinement to validate whether current bundled payment levels offer optimal value for money.

Recommendations:

To scale implementation, it is recommended that future datasets include structured fields for comorbidities, improve user interface designs with dropdown menus to reduce data entry errors, and establish clearer definitions for return-to-work categories. Further analysis with a larger sample size is warranted to accurately determine clinically meaningful cut-off time points in longitudinal observations, in addition to further benchmarking to refine bundled payment pricing for LBP care episodes.

Table 1. Demographic and clinical profiles of the studied population.

Variables		n/mean	%/SD
Gender	Male	86	88.7
	Female	11	11.3
Education level	Primary	37	38.1
	Secondary	27	27.8
	Tertiary	33	34.0
Age (years)	Mean= 50.01±13.86, median = 47 (IQR: 26), range: 26 to 79		
Treatment cost (SR)	Mean = 54,102±13,133.8, median = 53,170 (IQR:10,610), range: 30,500 to 112,542		
Longitudinal follow-up retention	Baseline	97	100.0
	1 month	71	73.2
	3 months	54	55.7
	6 months	42	43.3
Subjective health (EQ5D-Q06)*	Baseline	22.7	7.9
	1 month	79.6	14.1
	3 months	86.6	11.8
	6 months	88.3	13.8

*** Significant $F(3, 123) = 513.85$, $p = <0.001$, $\eta^2p = 0.926$**

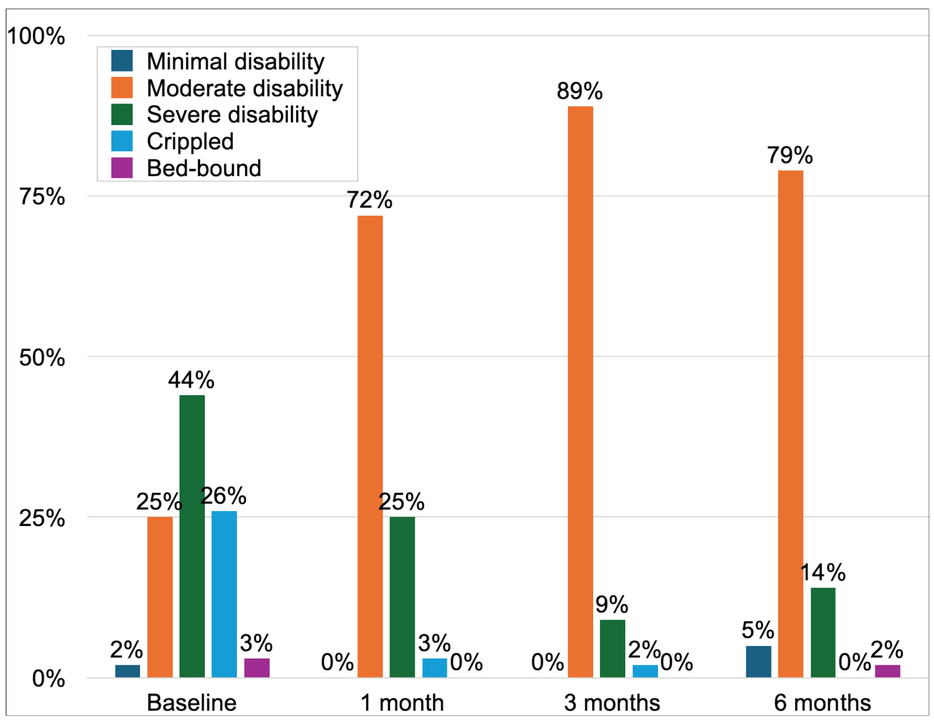

Figure 1. Percentages of functional disability levels over time.

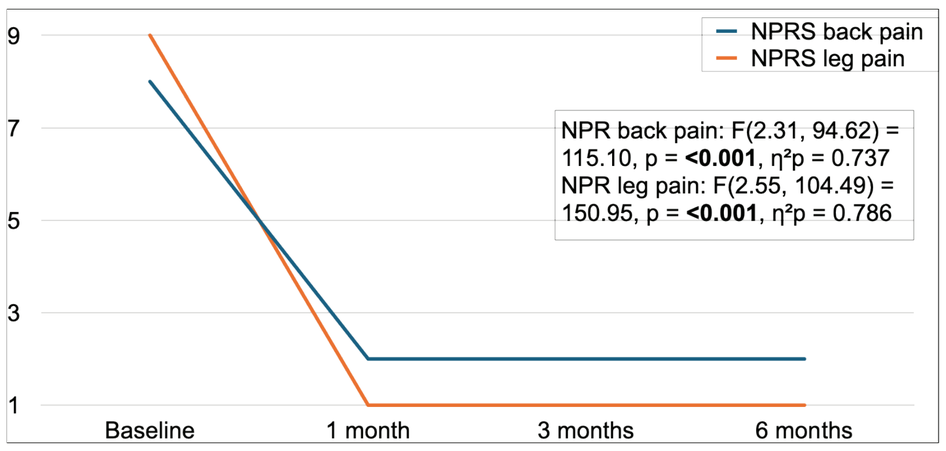

Figure 2. Mean back and leg pain intensity over time measured using NPRS .

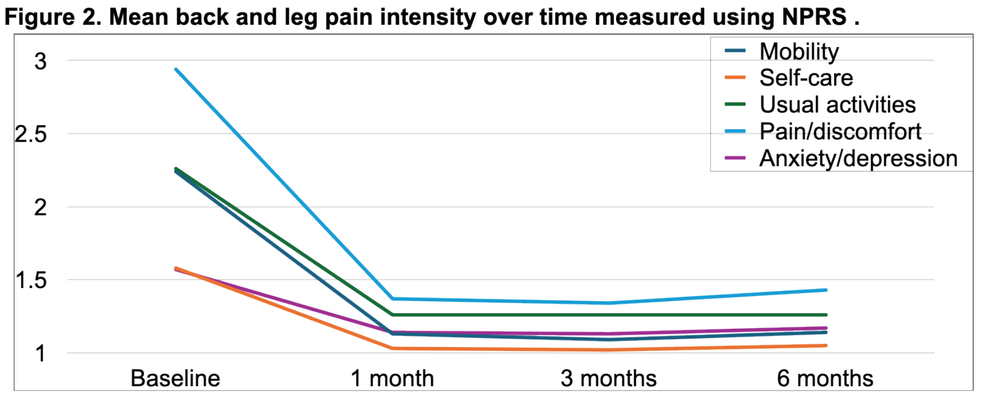

Figure 3. Mean scores across EQ-5D-3L domains over time.

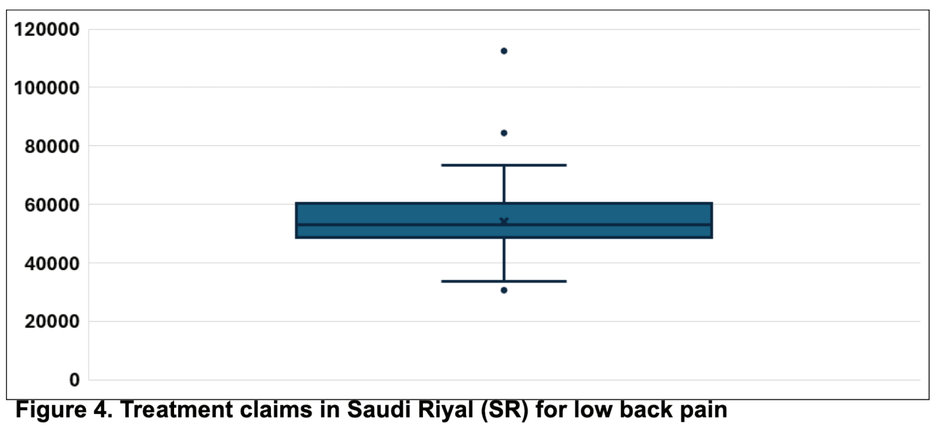

Figure 4. Treatment claims in Saudi Riyal (SR) for low back pain