Evaluating Quality of Life and Cost-Effectiveness in Adult Spine Surgery: Prospective Validation of Measurement Tools in a Local Adult Spine Patient Population

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CNS 2017 ANNUAL MEETING BOSTON, MASSACHUSETTS OCTOBER 7–11, 2017

Introduction

Quality of life and cost-effectiveness are important outcome measures in adult spine surgery. The patient-reported outcomes measurement information system (PROMIS) Global Health Scale (GHS) questionnaire is widely utilized but cannot be factored into cost-effectiveness, creating a barrier to improvement. Previous studies have proposed transformations of PROMIS-GHS to EuroQol (EQ-5D-3L) questionnaire data, which can be utilized to assess cost-effectiveness. However, such methods were not developed specifically in adult spine patients and thus may not be valid.

Methods

PROMIS-GHS and EQ-5D-3L were administered in random order to 52 consecutive adult spine patients, 46 of which were unambiguously completed and thus included. Demographics were also collected. EQ-5D-3L index values were calculated according to a validated United States value set. Our dataset was randomly partitioned into a training (n = 40) and a testing (n = 6) subset. Linear regression was utilized to develop a transformation and Bland-Altman agreement analysis was utilized to assess comparability between our model, previously reported models, and the

Results

The average age of our cohort was 60 +/- 14 years (range 21 - 85), 70% were female, and 95% completed at least high school. Linear regression produced a novel model in which three out of ten PROMIS-GHS items (general health, quality of life, and physical activities) were statistically significant indicators of EQ-5D-3L index values. Bland-Altman agreement analysis between our model, previously reported models, and the observed EQ-5D-3L index values revealed a substantial range of agreement.

Conclusions

To our knowledge, this study represents the first prospective validation study of transformations between PROMIS-GHS and EQ-5D-3L index values in adult spine patients. Our analysis suggests the existence of alternative linear models that appear to demonstrate agreement with previously established models. However, further studies with larger samples sizes are needed.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of validating literature methodology before implementing it.

References

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Table 1

Table 1. Descriptive summary of statistical cohort.

Characteristic	Full Sample (n = 46)
Age, mean ± standard deviation	60 ± 14
Sample range	21 - 85
Sex, % (n)*	
Female	70 (32)
Male	28 (13)
Race/Ethnicity, % (n)*	
African American	11 (5)
Caucasian American	83 (38)
Hispanic American	4 (2)
Highest Level of Education, % (n)	
Advanced Degree	15 (7)
Bachelor's Degree	24 (11)
Some College or Associate's Degree	37 (17)
High School Completion	20 (9)
Less than High School	4 (2)

*One person did not answer.

Table 2

Table 2. Bland-Altman agreement analysis

Testing Subset (n = 6)			
Range of Agreement, % (n/N)	Our Model vs Observed EQ-5D-3L Index Values	Revicki et al. Model vs. Observed EQ-5D-3L Values	Our Model vs. Revicki et al. Model
Mean Bias +/- 1 SD units	83 (5/6)	83 (5/6)	67 (4/6)
Mean Bias +/- 2 SD units	100 (6/6)	100 (6/6)	100 (6/6)

Abbreviations: SD = standard deviation.

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