Generating Uptake Probabilities from Discrete-Choice Experiment-Derived Preferences for Application in Patient-Centered Value Assessment

Nabin Poudel, PhD[1]; Salome Ricci, PharmD, MS[1]; Susan dosReis, PhD[1]; Alejandro Amill-Rosario, PhD[1]; Julia F. Slejko, PhD[1]
[1]University of Maryland School of Pharmacy, Patient-Driven Values in Healthcare Evaluation (PAVE) Center, Baltimore, MD

PCR144

INTRODUCTION

- Value assessment quantifies the relative value of healthcare interventions and guides healthcare decisions. [1,2]
- Cost-effectiveness analysis (CEA) is the de facto method for value assessment. [2,3]
- CEA utilizes quality-adjusted life year (QALY) to measure health benefits. [2,3]
- However, with the growing emphasis on patient involvement in healthcare decisions and their preferences for aspects of treatment beyond QALYs, there's a need for patient-centered value assessment. [4-6]
- Patient preferences derived as uptake probability from discrete-choice experiment (DCE) can be included into CEA for patient-centered value assessment.

STUDY OBJECTIVE

- **To explore whether patient preferences derived as uptake probability from pilot DCE for two hypothetical treatments can inform CEA to align with the goals of patient-centered value assessment.**

METHODS

Participants

- COPD patients in the US were recruited through ResearchMatch.
- Eligibility: 18 to 88 years old who has used or been offered medication and can read and write English.
- Eligibility was confirmed over a 10-min phone interview.
- Participants provided verbal consent for their participation.

Survey Questionnaire

- A cross-sectional web-based Qualtrics[XM] survey that consisted of a demographics questionnaire, COPD Assessment Test (CAT), DCE choice task and attribute importance questionnaire.

Attributes and Levels

- Six attributes: CAT symptom score improvement, doctor response time, medication dose frequency, treatment information source, side effects management, and out-of-pocket cost, along with their levels, were selected based on previous formative analysis. [6]

Experimental Design for DCE

- Orthogonal design generated nine choice tasks, each with three hypothetical treatment options (A, B, and C).
- Two hold-out tasks were added for internal validity.
- The DCE was pre-tested with 10 participants.
- All participants responded to 11 choice tasks with no opt-out options.

METHODS

Statistical Analysis

- Demographics summarized using descriptive statistics (mean for continuous, frequency for categorical).
- Multinomial Logit Model estimated the part-worth utility.
- Uptake for two hypothetical treatments was estimated using an established method. [7]

$$P_j = \frac{\exp(\text{utility for treatment j})}{\sum_{j\epsilon(1,n)} \exp(\text{utility for treatment j})}$$

Where, j=treatment alternative, n=number of treatments

- Out-of-pocket costs varied between $90 and $120 keeping all other attributes unchanged.

Hypothetical treatments

Treatment A

- CAT symptoms score improves by 4 points.
- The medication is taken 2 times per day.
- Manage side effect by no change.
- Out-of-pocket cost $90 per month.

Treatment B

- CAT symptoms score improves by 6 points.
- The medication is taken 1 times per day.
- Manage side effect by no change.
- Out-of-pocket cost $90 per month.

Application to Cost Effectiveness Analysis

- *Incremental Cost* (Δ Cost) =Cost for Treatment B-Cost of Treatment A. [8]
- *Incremental Benefit* (Δ Benefit) = (Uptake for treatment B- Uptake for treatment A)*1000 hypothetical cohort.
- Incremental cost-effectiveness ratio (ICER) $= \frac{\Delta \text{ Cost}}{\Delta \text{ Benefit}}$

RESULTS

- A total of 30 COPD patients (50% male, 87% White, 50% with public-only insurance) with mean age of 67 (SD=10) years, 12.3 (SD=7.2) years since COPD diagnosis, and CAT score value of 19.9 (SD=7.1) were included.
- MNL results showed that out-of-pocket cost was the most important attribute with conditional relative importance of (2.65), followed by CAT symptom score improvement (1.46), medication dose frequency (0.76), treatment information source (0.64), doctor response time (0.21), and side effects management (0.09).
- No change in levels for doctor response time and side effect management.

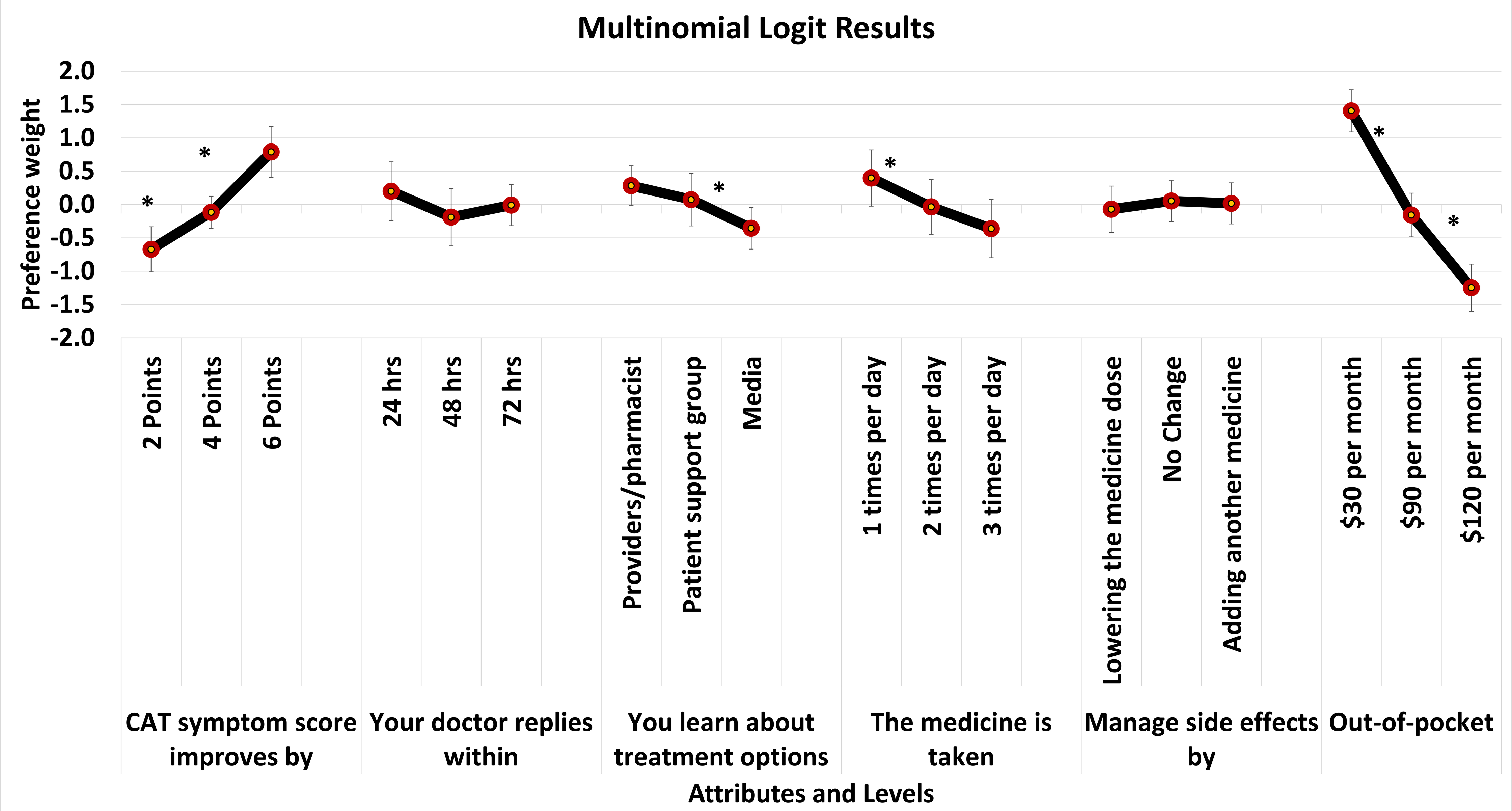
RESULTS

- At $90 out-of-pocket cost, uptake probability for treatment B was greater than treatment A (79% vs. 21%) and at $120 out-of-pocket cost for treatment B, uptake for treatment B was still greater than treatment A (56% vs. 44%).

Incremental Cost-Effectiveness (ICER)

Δ Benefit = [Uptake B (79%)-Uptake A (21%)]*1000=584 patients
Δ Cost =($2,365-$2,054)*584=$181,548
ICER=$18,1548/584=$311/per additional patients

- The findings can be applied to an efficiency frontier to evaluate cost-effectiveness of treatments



* Statistically significant at alpha=0.05

CONCLUSION AND RECOMMENDATIONS

- COPD patients valued attributes (CAT symptom score improvement, treatment information source, medication dose frequency, and out-of-pocket cost) of COPD treatment.
- Reducing out-of-pocket costs can significantly boost uptake probability for COPD treatment, underlining the importance of integrating preference data from DCE in CEA.
- Despite the notable increase in out-of-pocket costs ($90 to $120), the uptake for B was greater than A, suggesting patients place a higher value on treatment with greater symptom score improvement.
- Population-level updates of treatments influences the cost-effectiveness ratio offering the feasibility of patient-centered value assessment.
- Future research should investigate approaches for integrating uptake into CEA for patient-centered value assessment.

ACKNOWLEDGEMENTS

- The PAVE Center was established with a PhRMA Foundation Center of Excellence in Value Assessment Award.
- This work was funded by the PhRMA Foundation.

REFERENCES

SCAN ME
ISPOR 2024

University *of* Maryland School of Pharmacy

CONTACT INFO:
npoudel@rx.umaryland.edu
https://www.linkedin.com/in/nabin-poudel-27942659/