

Determinants of Quality of Life and Optimism in Patients With *EGFR*-Mutated Advanced Non-Small Cell Lung Cancer

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BACKGROUND

- Guidelines recommend an EGFR TKI as first-line treatment for patients with advanced or metastatic NSCLC harboring a common *EGFR* mutation¹
- However, disease progression eventually occurs in most patients, and a platinum-based chemotherapy regimen is often prescribed after failure of EGFR TKI(s)²
- Disease progression may negatively affect a patient's well-being due to concerns about disease prognosis, advancement of NSCLC symptoms, and drug tolerability issues tied to next-line anti-cancer treatment regimens
- This study aimed to describe sociodemographic and clinical determinants of quality of life and state optimism among patients with *EGFR*-mutated NSCLC treated with a first-line EGFR TKI or a subsequent chemotherapy-based regimen after failure of EGFR TKI(s)

CONCLUSION

- Patients who progressed to a chemotherapy regimen after failure of EGFR TKI(s) had lower GH/QoL but greater state optimism compared to patients treated with a first-line EGFR TKI
- Both GH/QoL and SOM were positively associated with greater expectations of therapy and negatively associated with having a caregiver and more severe NSCLC symptoms
- Efficacious treatments that improve patient expectations and satisfaction with therapy, reduce NSCLC symptoms, and prolong progression-free survival may help enhance the patient experience regardless of line of therapy
- Further research is needed to understand the role of optimism on the cancer continuum

METHODS

Study Design

- Cross-sectional, online survey of US patients between Nov 2022 and Jan 2023
- Recruitment by Global Perspectives (online panels, targeted social media advertising, traditional advertising direct to patients, and the Global Perspectives database)
- Survey length ~30 minutes; patients compensated at fair market value

Survey Eligibility

- ≥18 years of age
- Self-reported *EGFR*-mutated advanced or metastatic NSCLC
- Currently treated with 1L EGFR TKI monotherapy for ≥3 months, or
- Currently treated with a chemotherapy regimen for ≥3 months and previously treated with 1 or 2 lines of EGFR TKI monotherapy
- No treatment for cancer other than NSCLC in the prior 12 months
- Not currently participating in an interventional clinical trial
- Provided informed consent

Survey Measures

Question Type	Measures
Patient characteristics	Age, sex, race, region, smoking status, marital status, family/caregiver information, employment status, health insurance status, household income, cost of cancer treatment
Clinical characteristics	Comorbidities, stage at initial NSCLC diagnosis, time since initial NSCLC diagnosis, current NSCLC stage, duration of current treatment, symptoms on current therapy and their burden, occurrence of radiation and/or surgery
Lung cancer symptoms	Non-Small Cell Lung Cancer Symptom Assessment Questionnaire (NSCLC-SAQ ³) measures severity of pain and coughing, and the frequency of dyspnea, fatigue and appetite loss recalled in the past 7 days. Scored 0-20, with higher scores indicating more severe symptoms ³
Satisfaction with cancer treatment	Cancer Treatment Satisfaction Questionnaire (CTSQ ⁴) consists of 3 domains (Expectations of cancer therapy, Feelings about side effects, Satisfaction with cancer therapy) recalled in the past 4 weeks. Each domain scored 0-100, with higher scores indicating greater satisfaction ⁴
Quality of life	From the European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30 ⁵), the overall global health status/quality of life scale (GH/QoL ⁵) recalled in the past 7 days. Scored 0-100, with higher scores indicating better GH/QoL ⁵
State optimism	State Optimism Measure (SOM ⁶) includes 7 questions to assess degree of state optimism at the present moment. Scored 1-5, with higher scores indicating greater optimism ⁶

³Validated patient-reported outcome instruments.

Analysis

- Descriptive statistics were used to summarize patient responses
- To assess patient factors associated with quality of life and state optimism, generalized linear regression models were constructed using scores from the GH/QoL and SOM as dependent variables
 - Covariates for each model were selected based on the degree of collinearity, frequency distributions, clinical importance or significance in univariate analysis
 - A p-value of <0.05 was considered statistically significant

LIMITATIONS

- As patient recruitment and survey administration occurred online, results of this survey may not be generalizable to all patients with *EGFR*-mutated advanced or metastatic NSCLC
- The self-reported nature of the patient survey is associated with potential corresponding biases such as inaccurate recall and false reporting (whether intentional or unintentional)
- Multivariate analyses can only adjust for known confounding factors and no causal conclusions may be drawn. Further, the models were not statistically adjusted for multiple test procedures

RESULTS

- Patients treated with chemotherapy were slightly older, more likely to be male, and more likely to be a current or former smoker compared to those treated with an EGFR TKI (Table 1)
- Nearly all patients had health insurance, and the mean monthly out-of-pocket costs for cancer treatment was under \$120 for both treatment cohorts (Table 1)
- In each cohort, approximately 57% of patients had a caregiver to assist with their NSCLC management. While most caregivers were family members, patients receiving chemotherapy were more likely to have a paid employee compared to those treated with an EGFR TKI (Table 2)
- Nearly 80% of patients had stage 4 disease, and the median time since advanced or metastatic diagnosis was 8 months and 16 months for patients treated with an EGFR TKI and chemotherapy, respectively (Table 2)
- The median duration of current pharmacotherapy was 7 months for patients treated with an EGFR TKI and 6 months for those treated with chemotherapy (Table 2)
- Unadjusted mean scores for the NSCLC-SAQ and SOM were similar between treatment cohorts (Figure 1A and 1C). However, the chemotherapy group had marginally lower mean GH/QoL and CTSQ (all 3 domains) scores compared to the EGFR TKI group (Figure 1B and 1D)
- In adjusted analysis, patients treated with chemotherapy had significantly lower GH/QoL compared to those treated with an EGFR TKI. Higher GH/QoL scores were associated with being employed, greater expectations of therapy, and greater state optimism. Lower GH/QoL scores were associated with having a caregiver and more severe NSCLC symptoms (Figure 2)
- In adjusted analysis, patients treated with chemotherapy had significantly higher state optimism compared to those treated with an EGFR TKI. Higher SOM scores were associated with greater expectations and satisfaction with therapy and better GH/QoL. Lower SOM scores were associated with having a caregiver and more severe NSCLC symptoms (Figure 3)

Table 1. Patient Characteristics

Patient Characteristics	EGFR TKI Monotherapy n=159	Chemotherapy Regimen n=150
Age, median (Q1-Q3), y	61 (55-71)	63 (58-72)
Female, n (%)	88 (55.3)	70 (46.7)
Race, n (%)		
Hispanic	46 (28.9)	33 (22.0)
Black	22 (13.8)	26 (17.3)
Asian	8 (5.0)	9 (6.0)
White	41 (25.8)	45 (30.0)
Decline	42 (26.4)	37 (24.7)
US region, n (%)		
Northeast	31 (19.5)	18 (12.0)
Midwest	11 (6.9)	9 (6.0)
South	26 (16.4)	28 (18.7)
West	91 (57.2)	95 (63.3)
Marital status, n (%)		
Married/living with partner	115 (72.3)	110 (73.3)
Single, divorced, separated, widowed	44 (27.7)	40 (26.7)
Annual income, n (%)		
<\$35K	40 (25.2)	30 (20.0)
\$35K-\$75K	19 (11.9)	16 (10.7)
>\$75K	49 (30.8)	42 (28.0)
Decline to answer	51 (32.1)	62 (41.3)
Currently employed,* n (%)	26 (16.4)	18 (12.0)
Current health insurance, n (%)	158 (99.4)	150 (100)
Monthly OOP costs for cancer treatment, mean (SD), USD	118.8 (340.4)	115.4 (148.3)
Smoking status, n (%)		
Current	35 (22.0)	39 (26.0)
Former	69 (43.4)	89 (59.3)
Never	55 (34.6)	22 (14.7)

*Full time, part time, or self-employed.

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Table 2. Clinical Characteristics and Caregiver Status

Clinical and Caregiver Characteristics	EGFR TKI Monotherapy n=159	Chemotherapy Regimen n=150
Initial NSCLC diagnosis, n (%)		
Stage 1	13 (8.2)	30 (20.0)
Stage 2	34 (21.4)	41 (27.3)
Stage 3	35 (22.0)	19 (12.7)
Stage 4	77 (48.4)	60 (40.0)
Time since initial diagnosis, median (Q1-Q3), y	4 (2-7)	6 (3-10)
Current NSCLC, n (%)		
Stage 3b	8 (5.0)	4 (2.7)
Stage 3c	27 (17.0)	27 (18.0)
Stage 4	124 (78.0)	119 (79.3)
Time since current stage diagnosis, median (Q1-Q3), mo	8 (6-13)	16 (12-23)
Current treatment		
Duration of pharmacological therapy,* median (Q1-Q3), mo	7 (5-10)	6 (5-7)
Radiation while on current pharmacological treatment, n (%)	12 (7.5)	17 (11.3)
Surgery while on current pharmacological treatment, n (%)	3 (1.9)	0 (0.0)
Charlson Comorbidity Index, mean (SD)	7.66 (2.76)	7.96 (2.81)
Has caregiver to assist with NSCLC, n (%)	91 (57.2)	85 (56.7)
Relationship of caregiver ^b , n (%)		
Spouse or significant other	52 (57.1)	37 (43.5)
Child	27 (29.7)	20 (23.5)
Paid employee	10 (11.0)	21 (24.7)
Other	2 (2.2)	7 (8.2)
Hours of assistance per week, median (Q1-Q3)	15.0 (7.0-42.0)	28.0 (16.0-56.0)

*Among patients treated with EGFR TKI monotherapy, osimertinib was most frequently prescribed (33%). For patients treated with a chemotherapy regimen, 83.3% received a platinum-based combination.
^bAmong patients who reported having a caregiver.

Figure 1. Unadjusted Patient-Reported Outcome Scores

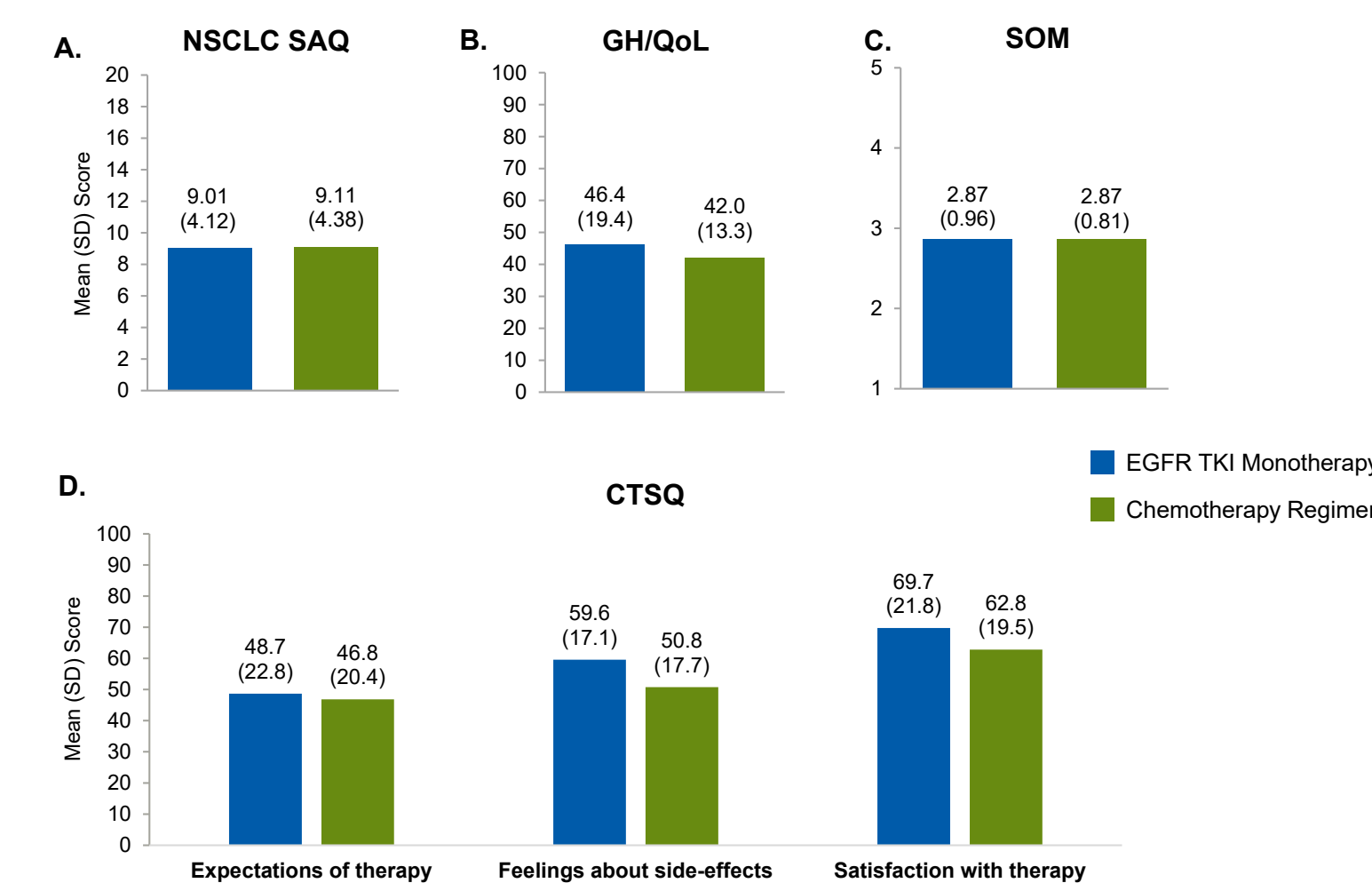
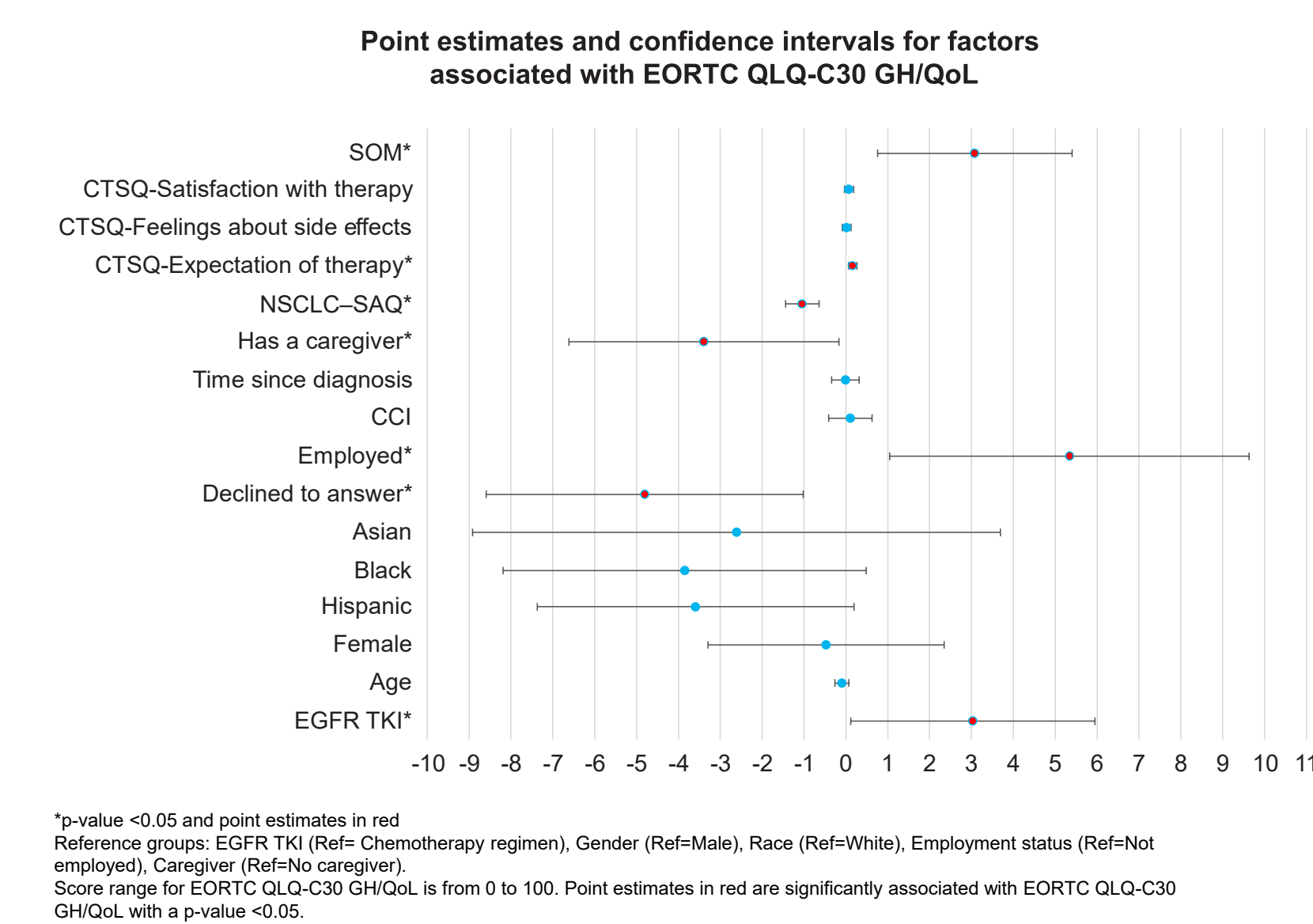
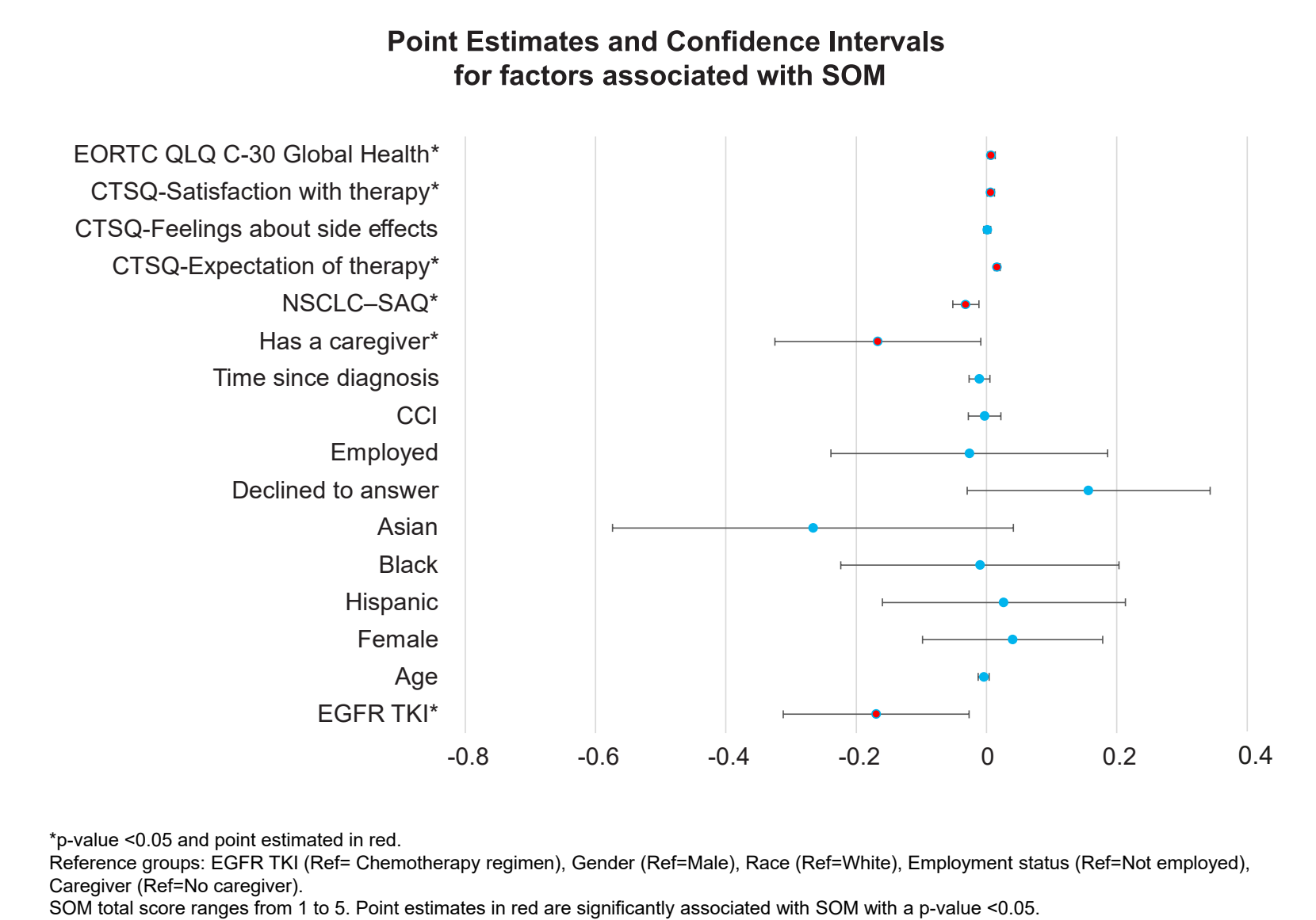


Figure 2. Factors Associated With Quality of Life



*p-value <0.05 and point estimates in red
Reference groups: EGFR TKI (Ref= Chemotherapy regimen), Gender (Ref=Male), Race (Ref=White), Employment status (Ref=Not employed), Caregiver (Ref=No caregiver).
Score range for EORTC QLQ-C30 GH/QoL is from 0 to 100. Point estimates in red are significantly associated with EORTC QLQ-C30 GH/QoL with a p-value <0.05.

Figure 3. Factors Associated With SOM



*p-value <0.05 and point estimated in red.
Reference groups: EGFR TKI (Ref= Chemotherapy regimen), Gender (Ref=Male), Race (Ref=White), Employment status (Ref=Not employed), Caregiver (Ref=No caregiver).
SOM total score ranges from 1 to 5. Point estimates in red are significantly associated with SOM with a p-value <0.05.

ABBREVIATIONS

Chemo, chemotherapy; CCI, Charlson Comorbidity Index; CTSQ, Cancer Therapy Satisfaction Questionnaire; EGFR, epidermal growth factor receptor; EORTC QLQ-C30 GH/QoL, European Organization for the Research and Treatment of Cancer Quality of Life-global health and quality of life scale; GH, global health status; Mo, month; Mono, monotherapy; NSCLC, non-small cell lung cancer; NSCLC-SAQ, non-small cell lung cancer - symptom assessment questionnaire; OOP, out of pocket; Q1, 1st quartile; Q3, 3rd quartile; QoL, quality of life; SOM, State Optimism Measure; TKI, tyrosine kinase inhibitor; Y, year.

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