

Concern about addiction is associated with lower quality of life in patients with osteoarthritis: an observational data analysis

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BACKGROUND

- Osteoarthritis (OA) pain is one of the most common and economically burdensome conditions in the United States, affecting approximately 20% of adults and resulting in substantial healthcare costs and lost work productivity.
- Clinical guidelines recommend a multimodal approach to treating OA, combining physical therapies with pharmacological intervention.
- According to a prior US treatment preference study of a hypothetical pharmacological treatment that would prevent OA from worsening, patients with OA would be willing to accept some degree of risk for adverse events¹.
- In a more recent study of OA patient preferences, Turk et al. (2020)² showed that control of OA pain and symptoms and reduced treatment-related risk of physical dependency would be the two most important attributes of a new medicine for adult patients with moderate to severe OA and inadequate response to pain treatment.
- Several different measurement instruments could be helpful in weighing these impacts on patient quality of life (QoL). One of the most widely used disease-specific measures of OA symptoms is the Western Ontario and McMaster Universities of Osteoarthritis Index (WOMAC)®.
- While the WOMAC is commonly used in clinical studies, it is not suitable for direct use in conventional economic evaluation because WOMAC scores provide neither a cardinal nor a preference-based index scale.
- Therefore, economic evaluations sometimes rely on a mapping from WOMAC to predict the EQ-5D. Several studies, including Cappelleri et al. (2016)³, have shown consistent statistical relationship between the two with demonstrated goodness of fit.

OBJECTIVE

- In the current research, we aim to evaluate the relationship between self-reported concerns about becoming addicted to a medicine (for this condition, opioids) and individual patient QoL measured alternatively by (a) the EQ-5D-5L Index score (EQ-5D) and (b) the EQ-5D Visual Analogue Scale (VAS) in patients with OA.

METHODS

- This unique, observational study used patient-level cross-sectional survey data collected from February-May 2017 from the US Adelphi Disease Specific Programme (DSP)[™].⁴
- The Adelphi DSP for OA selected 153 physicians (primary care, rheumatology, and orthopedic surgeons) identified from publicly available lists of healthcare professionals.
- Physicians completed an online survey and an electronic patient record form collecting de-identified data on their next 9 adults (≥18 years) patients with OA.
- Each patient was invited to complete a self-completion survey relevant to the disease area.
- The question of interest was about "concerns of medication addiction" as reflected in the Likert-scale question:
 - Completely agree (1) to completely disagree (5) with the statement "I am concerned about becoming addicted to my medicine".

METHODS (CONT.)

- A set of ordinary least squares (OLS) regressions using QoL measures (EQ-5D Index score and EQ-5D VAS) as outcomes and Concern about addiction (CAA) as a continuous predictor were estimated, including models with CAA as a categorical predictor as a sensitivity analysis.
- The relationship between EQ-5D Index score as a predictor and EQ-5D VAS as the outcome was also studied.
- Treating the EQ-5D VAS as the more general indicator of QoL, an OLS regression with the EQ-5D VAS as an outcome and with the EQ-5D-5L Index score and the CAA as two independent continuous predictors was estimated in this sample.
- Correlations between the measures were also assessed.

RESULTS

- A total of 866 OA patients completed the survey with the majority being female (61.2%), white (77.7%) and with mean age of 64.2 years (SD 11.7).
 - 835 patients completed the single item: 'I am concerned about becoming addicted to my medicine' (CAA)
- The CAA responses were well distributed with sizable representation for each category: about one-third of the patients responded that they "agree" (18%) or "completely agree" (11%), while 27% responded "completely disagree" and 20% "disagree" (Figure 1).
- The relationship between CAA as a continuous predictor and the EQ-5D Index score revealed that a one-category increase in CAA score is associated with a 0.029 reduction in the EQ-5D Index score, equivalent to 0.14 in terms of the standardized effect sizes (ES), which can be interpreted "trivial-to-small" effect (Figure 2).
- The difference in means between the lowest category ("Completely disagree") and the highest category ("Completely agree") corresponds to value of 0.11 ($p < 0.0001$) in the EQ-5D Index score (a "median" 0.57 ES). Correlation between CAA and the EQ-5D Index score is 0.19 (p -value <0.0001).
- The relationship between CAA and EQ-5D VAS showed that one-category increase in CAA score was associated with a 2.6 point reduction in the EQ-5D VAS (0.15 ES). The difference in means between the lowest and the highest category is 10.5 ($p < 0.0001$) representing "medium" ES of 0.59. Correlation between CAA and the EQ-5D VAS is 0.20 (p -value <0.0001) (Figure 3). Using CAA as a categorical predictor indicated that a linear approximation is appropriate in both models.
- A significant and robust relationship between EQ-5D VAS as an outcome and EQ-5D Index score as a predictor was observed (slope: 60.7; p value <0.0001). Correlation between EQ-5D Index score and the EQ-5D VAS is substantial 0.69 (p -value <0.0001) (Figure 4). Using EQ-5D Index score as a categorical predictor indicated that a linear approximation is appropriate.
- When both EQ-5D Index score and CAA scores were used simultaneously as predictors of EQ-5D VAS, the effect of CAA (after adjusting for EQ-5D Index) was still significant (slope: -0.97, $p=0.0071$) (Table 1).
- In this case, the difference between the CAA lowest and highest categories is 3.89 and the associated ES is 0.22, which would be regarded as "small". This is equivalent to -0.039 on a utility scale of 0-1.0, which would be regarded as significant in utility and economic terms.

FIGURE 1: Distribution of Response

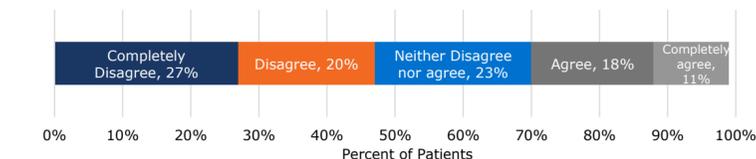


Figure 1. Distribution of the responses to the question/item "I am concerned about becoming addicted to my medicine"

FIGURE 2: Relationship between EQ-5D Index Score and CAA Score

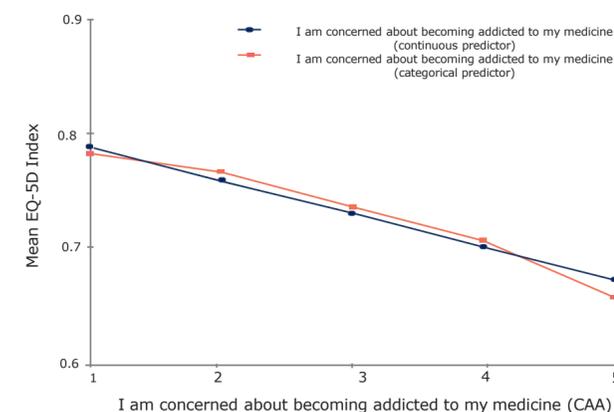


Figure 2 shows the relationship between EQ-5D Index score and CAA score. This graph indicates that the linearity assumption, after allowing for natural sampling variation, for the relationship between EQ-5D Index score and CAA is appropriate

TABLE 1: Predicting EQ-5D VAS with EQ-5D Index Score and CAA

Effect	Estimate	Standard Error	P Value
Intercept	33.5593	2.2028	<.0001
EQ-5D Index	58.4143	2.3753	<.0001
CAA	- 0.9734	0.3603	0.0071

Table 1 shows that effect of the CAA is still significant (slope: -0.9734; p -value=0.0071)

CONCLUSIONS

- Patients with a diagnosis of OA who have concerns about medication addiction have significantly and meaningfully different EQ-5D Index and EQ-5D VAS scores compared with patients who do not have this concern.
- Concern about addiction has an additional negative impact – of potential clinical and economic importance – that is not fully captured in EQ-5D Index.
- Health technology assessment authorities who rely on the EQ-5D Index score may underestimate the value of products that reduce concerns about opioid addiction.
- It would be worthwhile to consider a "bolt-on" question for inclusion, after successful psychometric validation, about these concerns in an assessment of the impact of new interventions on OA patients⁵.

DISCLOSURES

Research funding provided by Pfizer, Inc and Eli Lilly and Company. LPG: received consulting fees associated with this study. PS, MD, LT, JC, AB: employees and stockholders of Pfizer. RLR, JH: employee of Eli Lilly and Company and own stocks. JJ and MB: employees of Adelphi Real World.

FIGURE 3: Relationship between EQ-5D VAS Score and CAA Score

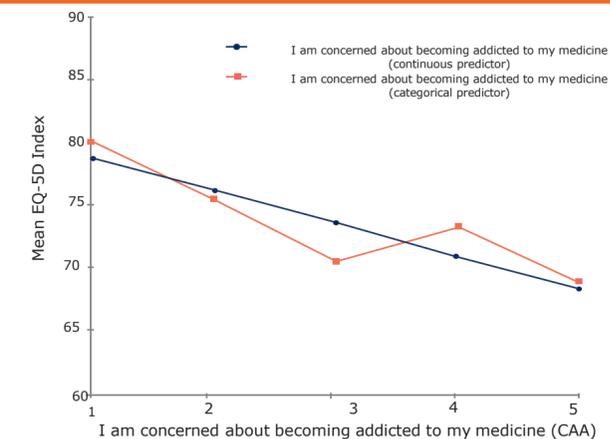


Figure 3 depicts the relationship between EQ-5D VAS score and CAA score. This graph indicates that the linearity assumption, after allowing for natural sampling variation, for the relationship between EQ-5D VAS score and CAA is appropriate.

FIGURE 4: Relationship between EQ-5D VAS vs EQ-5D Index Score

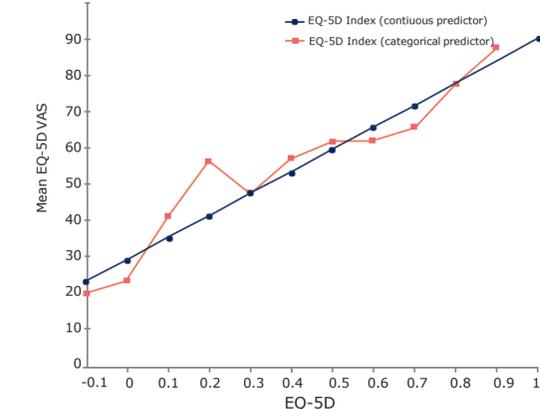


Figure 4 shows the relationship between EQ-5D VAS and EQ-5D Index score. This graph indicates that the linearity assumption, after allowing for natural sampling variation, for the relationship between EQ-5D VAS and EQ-5D Index score is appropriate.



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