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### ► To cite this version:

Zobair M Younossi, Yusuf Yilmaz, Jian-Gao Fan, Ming-Hua Zheng, Khalid Alswat, et al.. Stigma is a Predictor of Impairment of Health Related Quality of Life among Patients with NAFLD. AASLD The Liver Meeting 2023, Nov 2023, San Diego, CA, United States. inserm-04548946

**HAL Id: inserm-04548946**

**<https://inserm.hal.science/inserm-04548946>**

Submitted on 16 Apr 2024

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## Stigma is a Predictor of Impairment of Health Related Quality of Life among Patients with NAFLD

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**Background:** Stigma associated with non-alcoholic fatty liver disease (NAFLD) can be consequential and associated with impairment of health-related quality of life (HRQL).

**Aims:** To evaluate association between stigma and HRQL scores among NAFLD patients.

**Method:** NAFLD patients were invited to complete the Chronic Liver Disease Questionnaire-NAFLD (CLDQ-NASH; 36 items, 6 domains, range 1-7, higher scores indicate better HRQL) and a specifically designed stigma survey which asked about history of stigmatization or discrimination due to chronic conditions, various aspects of disease burden [Liver Disease Burden (LDB) instrument; 35 items, 7 domains including Stigma, range 1-4, higher scores indicate greater disease burden], and perception of various diagnostic terms for NAFLD.

**Results:** The CLDQ-NASH and the stigma survey were completed by 377 NAFLD patients (9% <35 years, 50% ≥55 years, 52% male, 56% college-educated, 47% with ≥2 chronic comorbidities, 45% type 2 diabetes, 20% severe fibrosis or cirrhosis) from 12 countries (47% USA). The mean (±SD) CLDQ-NASH score was 5.23±1.11, with the greatest HRQL impairment seen in the Fatigue domain (mean score 4.60±1.54). Of included patients, 15% reported having experienced stigma or discrimination (at least sometimes) due to NAFLD and 42% due to being overweight/obese; the mean LDB Stigma score was 2.31±0.69, and 26% reported being uncomfortable with the diagnostic term “NAFLD”. All aspects of NAFLD stigma (self-reported history of stigmatization due to NAFLD, having LDB Stigma score in the top quartile, and being uncomfortable with the term “NAFLD”) were associated with lower HRQL scores in all domains ( $p \leq 0.01$ ); the magnitude of the association varied between -0.33 and -1.29, with the strongest HRQL impairment observed in the Worry domain of CLDQ-NASH (Figure). In addition, all HRQL scores were significantly negatively correlated with all LDB scores ( $\rho$  from -0.13 to -0.48, all  $p < 0.01$ ; the strongest between Worry of CLDQ-NASH and Stigma of LDB). In multivariate regression analysis adjusted for the country of enrollment, history of stigmatization or discrimination due to NAFLD was the strongest independent predictor of lower HRQL scores in all domains (beta -0.63 to -1.02,  $p < 0.001$ ). In addition, high LDB Stigma scores were independently associated with Emotional Well-Being and Worry of CLDQ-NASH (beta -0.43 to -0.49,  $p < 0.01$ ) while history of stigmatization due to being overweight/obese was associated only with Activity of CLDQ-NASH (beta=-0.36,  $p=0.01$ ). In contrast, negative perception of the diagnostic term “NAFLD” was not

associated with HRQL scores (all  $p>0.05$ ). Other predictors of lower HRQL scores in NAFLD included female sex, lack of college education, having  $\geq 2$  chronic comorbidities, history of weight loss due to medical reasons, and having severe fibrosis or cirrhosis ( $p<0.05$ ).

**Conclusions:** As a major independent predictor of quality-of-life scores, stigmatization of the condition is not harmless for patients with NAFLD.

