Trajectory of Anxiety Following Liver Transplantation

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Background

- The trajectory of anxiety immediately following liver transplantation (LT) remains poorly documented.
- Patient reported outcomes measures (PROMs) allow for precise and efficient assessment and may help monitor anxiety symptoms over time.
- The Patient Reported Outcome Measurement System (PROMIS) anxiety computer adaptive test (A-CAT) is a minimally burdensome tool that has been validated in several patient populations.
- We assess changes in anxiety severity over time among recent LT recipients using the PROMIS-A CAT.

Methods

Sample

- Single centre, longitudinal study.
- Convenience sample of incident (<30 days post-transplant) adult LT recipients, recruited in 2021-2024.

Inclusion Criteria:
- > 18 years of age
- Received a liver transplant within 30 days prior to enrollment

Exclusion Criteria:
- No English fluency
- Not having completed the PROMIS-A CAT
- Diagnosis/conditions that would have hampered questionnaire completion

Data Collection

- Patients were approached on the inpatient ward (baseline or week 0) and followed as outpatients (weeks 2-12).

INPATIENT (WARD):

Baseline - Week 0
1. Demographic questionnaire (self-report)
2. Clinical data from health records
3. PROMIS-A CAT (electronic data capture platform; on tablets)

OUTPATIENT (REMOTE):

Biweekly Follow-Up - Weeks 2-12
1. PROMIS-A CAT only (electronic data capture platform; over email)

- The PROMIS T score metric (20-80; higher scores indicate more severe anxiety) is standardized to yield a mean of 50 (standard deviation [SD] 10) which corresponds to the mean score of the U.S. general population.

Analysis

- Continuous variables summarized using means ± SD for normally distributed data and categorical variables presented as n (%).
- Trajectory of average T scores at baseline and 12-weeks.
- Time-to-event (Kaplan Meier (KM) analysis of patients that improved 5 points (half SD) and 10 points 1 SD) or more from their baseline.
- Time-to-event (KM) analysis of patients with scores at or better than the U.S. general population mean and below the moderate/severe PROMIS- CAT T-score range .

Results

Table 1. Participant Baseline Characteristics

Characteristics	Total cohort (74)	Male (43)	Female (31)	P-value
Age (SD)	52 (14)	54 (14)	49 (13)	P = 0.146
Marital Status N (%)				
Single	9 (13%)	8 (20%)	1 (3%)	P = 0.082
Married/ Common Law	52 (75%)	29 (73%)	23 (79%)	
Divorce/Separated/ Widowed	8 (12%)	3 (8%)	5 (17%)	
Racialized Status N (%)				
White	50 (75%)	26 (68%)	24 (83%)	P = 0.014
Asian	9 (13%)	9 (24%)	0 (0%)	
Black	0 (0%)	0 (0%)	0 (0%)	
Other	8 (12%)	3 (8%)	5 (17%)	
Ontario Marginalized Index (OMI) N (%)				
Low Deprivation	24 (39%)	14 (38%)	10 (40%)	P = 0.309
Moderate Deprivation	17 (27%)	8 (22%0	9 (36%)	
High Deprivation	21 (34%)	15 (41%)	6 (24%)	
Education N (%)				
< 12 years	22 (33%)	13 (33%)	9 (32%)	P = 0.918
> 12 years	45 (67%)	26 (67%)	19 (68%)	
Days Since Transplant (IQR)	7 (5-11)	8 (5-12)	7 (4-10)	
Etiology of Liver Failure N (%)				
Cancer Hepatocellular	12 (17%)	9 (23%)	3 (10%)	P = 0.337
Cancer; Other	3 (4%)	2 (5%)	1 (3%)	
Hepatitis B	2 (3%)	2 (5%)	0 (0%)	
Non-alcoholic Fatty Liver	7 (10%)	3 (8%)	4 (13%)	
Alcoholic Fatty Liver	16 (23%)	11 (28%)	5 (17%)	
Autoimmune Liver Disease	3 (4%)	1 (3%)	2 (7%)	
Genetic Liver Disease	1 (1%)	0 (0%)	1 (3%)	
Other/Unknown	26 (37%)	12 (30%)	14 (47%)	
Charlson Comorbidity Index (CCI) N (%)				
< 4	36 (57%)	18 (51%)	18 (64%)	P = 0.306
≥ 4	27 (43%)	17 (49%)	10 (36%)	
Diabetes (Yes) N (%)	15 (34%)	13 (45%)	2 (13%)	P = 0.037

Figure 1. Scatterplot of average PROMIS-A CAT mean T-scores (SD) for LT recipients at baseline (week 0) and follow-up (weeks 2-12).

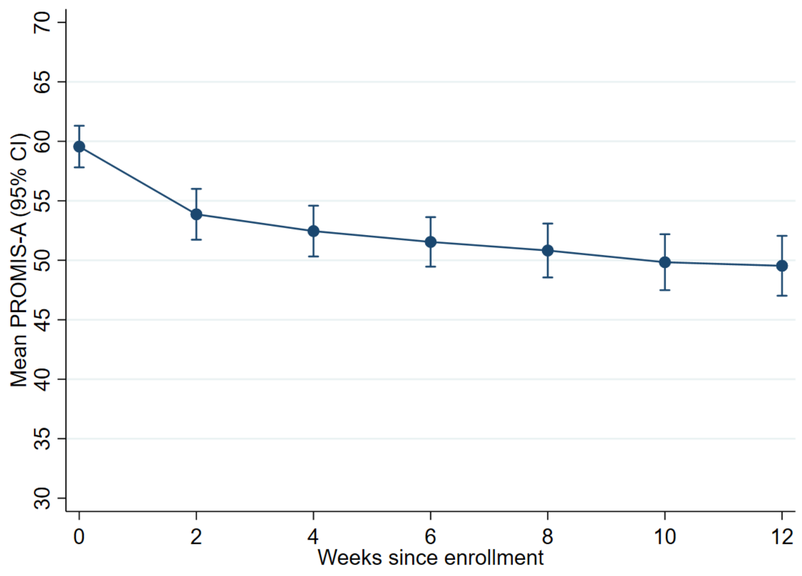


Figure 2. Time-to-event (KM) analysis when the event is PROMIS-A CAT score of ≤ 50 (U.S. General Population mean).

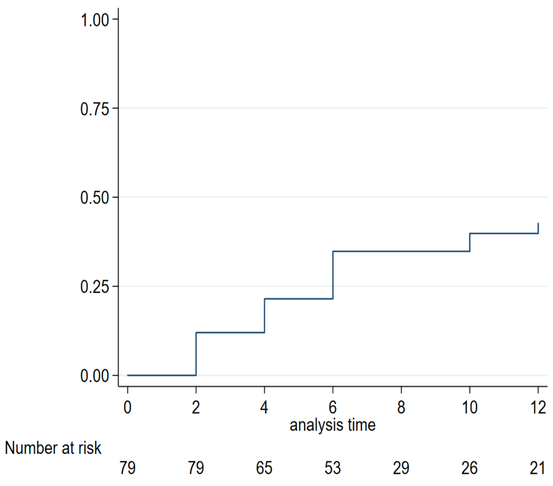


Figure 3. Time-to-event (KM) analysis when the event is PROMIS-A CAT score of ≤ 60 (moderate/severe symptoms).

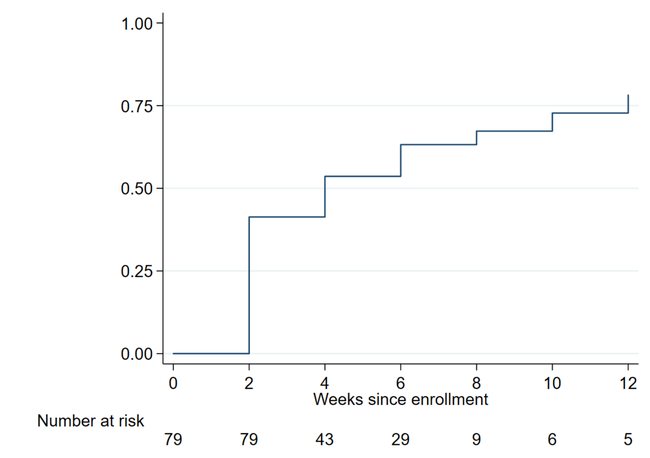


Figure 4: Time-to-event (KM) analysis of an improvement 5 points (half SD) from baseline (week 0).

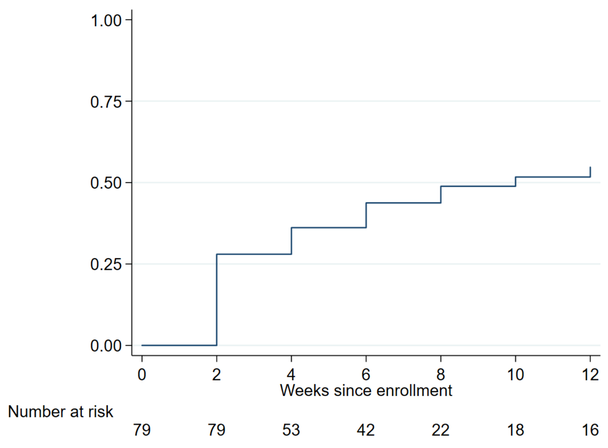
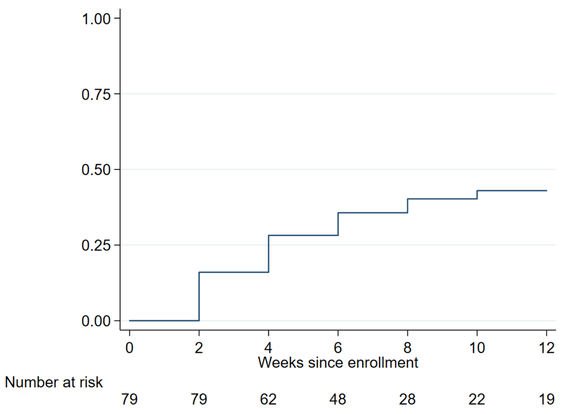


Figure 5. Time-to-event (KM) analysis of an improvement 10 points (1 SD) from their baseline (week 0).



Conclusion

- By 12 weeks post-transplantation:
  - The mean PROMIS-A score among LT recipients was approaching that of the U.S. general population.
  - About half of the participants improved by at least 5 points.
  - More than half of LT recipients scored ≤ 50 at 12 weeks post-enrollment.
  - A minority fo LT recipients scored ≤ 60 or within the moderate/severe range at 12 weeks post-enrollment.
- These findings add to our understanding of the recovery of anxiety following LT.
- Future studies should consider developing further educational resources to help inform LT recipients about anxiety symptoms during the post-transplant recovery process and patient specific resources to manage anxiety.

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