

Racial disparity exists in the utilization and post-transplant survival benefit of ventricular assist device support in children

J. Greenberg, et al. *JHLT* May 2023 | <https://doi.org/10.1016/j.healun.2022.12.020>

Study Highlights

Objective: To assess whether racial and ethnic discrepancies exist in ventricular assist device (VAD) utilization and outcomes on pediatric patients that were bridged to transplant (BTT) with VAD.

Methods: The United Network for Organ Sharing (UNOS) database was used to identify children (age <18) listed for heart transplant between 2006 and 2021. The 3 most common race and ethnicity groups were included, Black (B), Hispanic (H), and White (W). VAD at listing and VAD at transplant variables were used to determine VAD utilization. Multivariable Cox proportional analyses were used to study the influence of race and ethnicity on post transplant survival (PTS) for children BTT with VAD.

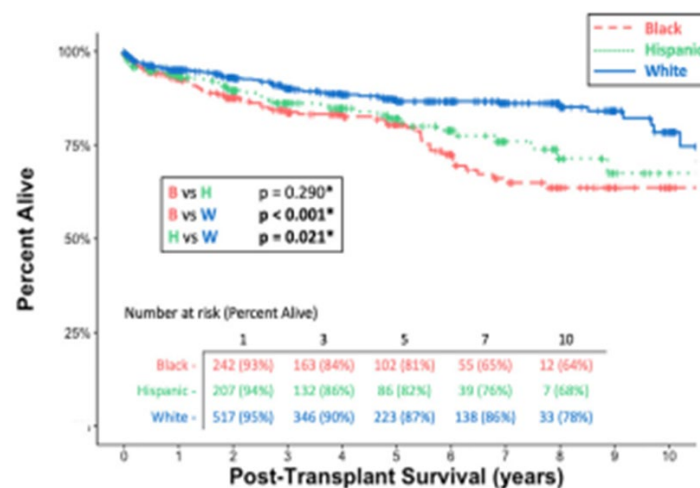
Results: 6,121 pediatric heart transplant candidates were included. VAD utilization was the highest in black children (Table 2, B=11%, H=8%, W=8%, p= 0.001 for B vs H&W). Black children were listed with the greatest clinical acuity (UNOS status 1A, p <0.001 vs H&W), had more functional limitation (p <0.001 vs. H&W), and required more inotropic support (p =0.017 vs. H). One year PTS was observed to be equal for all groups, but long-term PTS is far worse in Black and Hispanic children

Conclusion: Utilization of pediatric VAD is equitable across all three studied racial groups, but long-term PTS and benefits remain suboptimal for non-white children.

Table 2 Ventricular Assist Device (VAD) Utilization by Race/Ethnicity

	(B) Black	(H) Hispanic	(W) White		p-value
VAD at listing	216 (11%)	145 (8%)	425 (8%)	B vs H	0.001
Paracorporeal pulsatile	69 (32%)	63 (44%)	179 (42%)	B vs W	0.001
Paracorporeal continuous	31 (14%)	22 (15%)	55 (13%)	H vs W	0.351
Intracorporeal continuous	116 (54%)	60 (41%)	191 (45%)		
VAD at transplant	318 (24%)	265 (21%)	673 (19%)	B vs H	0.111
Paracorporeal pulsatile	134 (42%)	139 (52%)	342 (51%)	B vs W	0.001
Paracorporeal continuous	25 (8%)	28 (11%)	59 (9%)	H vs W	0.187
Intracorporeal continuous	159 (50%)	98 (37%)	272 (40%)		

Values expressed as n (%) or (%).



Legend: VAD utilization by Race/Ethnicity (top) and Post-transplant survival between Black (B), Hispanic (H), and White (W) patients bridged to transplant on VAD (bottom)

Reviewer's Comments

- Development of newer, smaller VADs for children was significant to reduce waitlist mortality by 50%. Despite this advancement, long term PTS remains poor in non-white children due to underlying inequities in social determinants of health.
- Primary benefits of VAD therapy in children is observed mainly in the pre-transplant and early post-transplant periods.
- Study findings suggest that changes are needed for implantation of VAD, but further work is imperative to address the disparities that impact long term PTS for non-white children.

Limitations

- Study only examined the three most common race and ethnicity categories (B, W, H). More studies are needed to determine if analysis from the present study will apply to other lesser represented groups.
- Data on hospital outcomes is limited to what is reported to UNOS.
- Socioeconomic factors such as income and educational level are less applicable to the pediatric population.

Mismatch identified in symptom burden profiles in lung transplantation

B. Koons, et al. *Heart & Lung* May 2023 | <https://doi.org/10.1016/j.hrtlng.2023.02.0111>

Study Highlights

Objective: Among lung transplant candidates, there is a diversity of symptom burden that may not be attributed to objective measures of illness severity. This study aimed to:

1. Describe symptom burden
2. Identify profiles of symptom burden and illness severity
3. Establish whether observed profiles reflect differences in social determinants of health (SDOH)

Methods: This is a single-center, prospective study of 93 adult lung transplant candidates listed between 02/2019 and 01/2021. The Memorial Symptom Assessment physical and psychological subscale (MSAS) score was used to measure symptom burden. Illness severity was determined by the lung allocation score (LAS). MSAS and LAS latent profile analysis was used to generate distinct patient profiles.

Results: Of the 93 participants, there were three identified SDOH profiles. A majority (71%) made up the mild profile with mild MSAS and mild LAS scores. The 29% remaining were mismatched where 9% had moderate MSAS but severe LAS and 20% reported severe MSAS with mild LAS. These two mismatched groups were younger, racially diverse, and had higher psychosocial risk scores.

Conclusions: Symptom burden is complex and does not always represent illness severity. SDOH should be considered in symptom severity and burden.

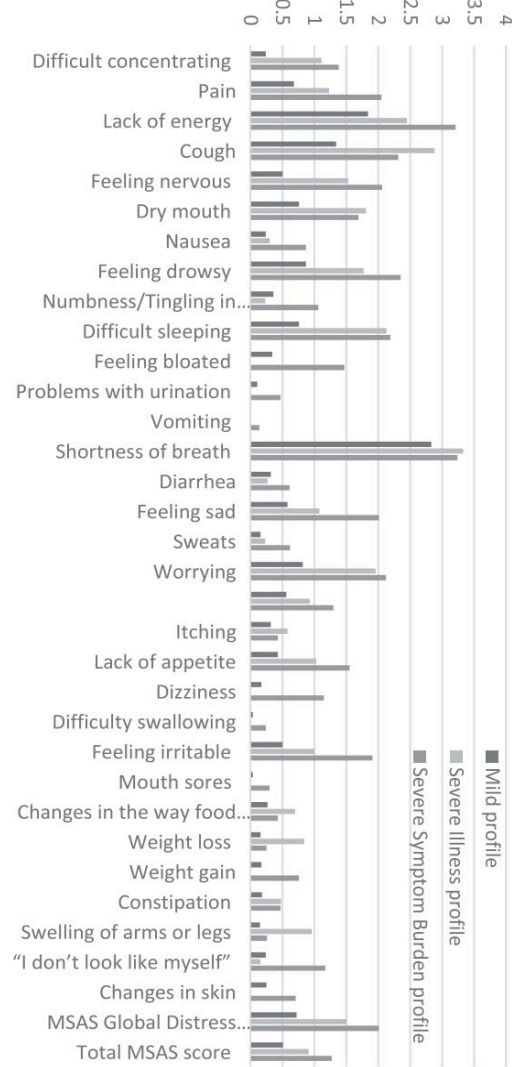


Fig. 4. Total MSAS symptom burden scores by profile. This figure presents symptom burden scores (score range 0-4, higher scores indicate severe symptom burden): the Memorial Symptom Assessment Scale (MSAS). Each symptom burden score is presented by the observed symptom profile.

Reviewer's Comments

- Patient centered outcomes were not evaluated at this time and may influence the patient experience while waiting for and living with an organ transplant.
- There are reports of inequities in the patient experience based on SDOH.
- This study highlights the heterogeneous symptom burden among lung transplant candidates.
- Accounting for, and identifying, inequities may influence the patient's clinical outcomes and improve quality of life with end-stage organ failure.

Limitations

- This study had a small sample size and single center design which limits generalized results.
- Pulmonary hypertension and cystic fibrosis patients were underrepresented in this study.
- Patients that could not be generalized into the findings were those deemed "too sick" to participate, and typically mechanically ventilated or sedated on extracorporeal membrane oxygenation.
- Due to the small sample size, there were only three profiles identified. Additional strata may exist.
- Limited SDOH data was available.

Individual-Level Socioeconomic Position and Long-Term Prognosis in Danish Heart-Transplant Recipients

Mols, et al. *Transplant Int* Mar 2023 | <https://doi.org/10.3389/ti.2023.10976>

Study Highlights

Objective: Socioeconomic deprivation can limit access to healthcare. The impact of socioeconomic position (SEP) on long-term prognosis in heart transplant recipients was yet to be assessed in a European universal healthcare system with free access to multidisciplinary team management programs.

Methods: A total of 649 first-time heart transplant recipients in Denmark were identified using national database sources. The impact of all exposure variables on prognostic outcomes within follow-up intervals: 0–1, >1–10, and >10–20 years were analyzed. The risk of all-cause mortality and first time major adverse cardiovascular event (MACE) were analyzed using Kaplan-Meier method; crude and adjusted hazard ratio (HRs) were computed using Cox proportional Hazards regression within the dichotomized socioeconomic groups.

Results: The half-time survival was 15.6 years. Low educational level was associated with higher all-cause mortality (adjusted HR 1.95, 95%CI:1.19-3.19) within 10-20 years after transplant; low educational level (adjusted HR 1.66, 95% CI 1.14-2.43) and low income (adjusted HR 1.81, 95% CI 1.02-3.22) were associated with higher MACE within 1-10 years post-transplant.

Conclusions: Low levels of education and income were associated with a poorer prognosis after heart transplantation.

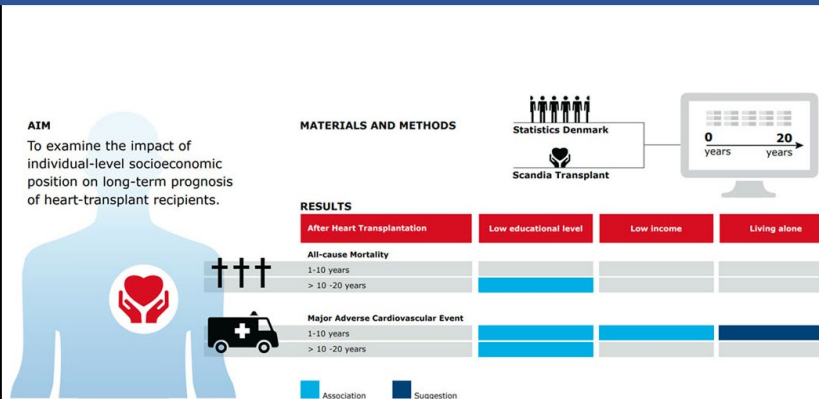


Figure 1. Association between socioeconomic position and all-cause mortality and first-time major adverse cardiovascular event.

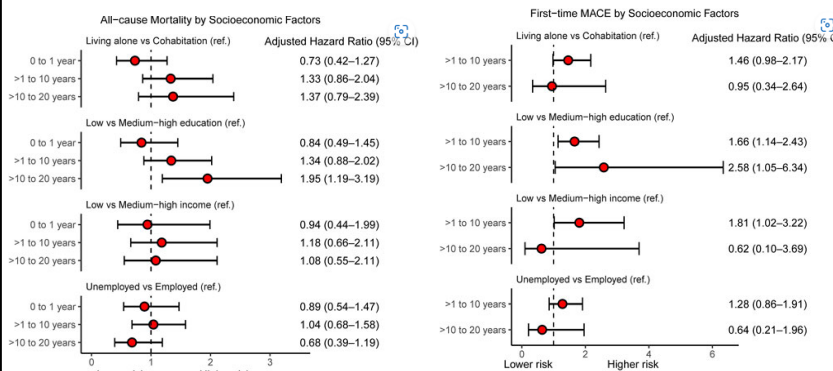


Figure 2. Association between socioeconomic position and all-cause mortality.

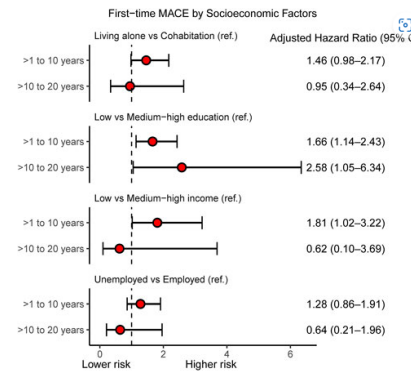


Figure 3. Association between socioeconomic position and first-time major adverse cardiovascular event.

Reviewer's Comments

- This population-based study was conducted in a European university healthcare system with free access to health care and highlighted the socioeconomic impact on heart transplant long-term prognosis in Denmark.
- Low educational attainment was the most influential factor on both mortality and MACE post transplant. Low income was only associated with higher risk for MACE.
- Future studies need to be done on socioeconomic factors and their influence on both adherence and rehabilitation to support adequate self-management, self-efficacy, and health literacy after heart transplant.

Limitations

- The baseline characteristics did not include type of donor (DBD vs DCD), which may influence the outcomes.
- The data from the Danish Causes of Death Registry (DCDR) were not validated. The underlying cause of death depended on the decision of individual physician.
- A small sample size of females was included in this study, which was challenging to draw a conclusion on gender disparities.

PROMIS: Physical, Mental and Social Health Outcomes Improve From Before to Early After LVAD Implant: Findings From the Mechanical Circulatory Support: Measures of Adjustment and Quality of Life Study

E Hahn, et al. *J. of Cardiac Failure* Mar 2023 | <https://doi.org/10.1016/j.cardfail.2023.03.013>

Study Highlights

Objective: Evaluate PROMIS (Patient-Reported Outcomes Measurement Information System) physical, mental and social health outcomes in the pre- vs post-LVAD implant time-frames and to show responsiveness validity.

Methods: Adult participants (n=272) were enrolled from 12-different U.S. Sites and completed questionnaires assessing 12 PROMIS physical, mental, and social health measures prior to transplant and at 3- and 6-months post-transplant. These results were correlated to “anchors” that included reported outcomes (PROs), clinician ratings, and performance tests pre- and post-LVAD to show responsiveness validity in the PROMIS outcomes.

Results: There was statistically significant improvement in 11 of 12 PROMIS measures pre-implant compared to Month 3 (P < 0.01), but no change between Months 3 and 6. Analysis of anchor changes pre- and post- transplant were statistically significant at 3 months (P < 0.05), but only half were significant between Month 3 and 6.

Conclusion: The PROMIS measures correspond to significant improvement between pre-implant and 3 months post-LVAD, but little change between 3 and 6 months. Responsiveness validity was demonstrated when compared to other validated measures of clinical and health outcomes (anchors).

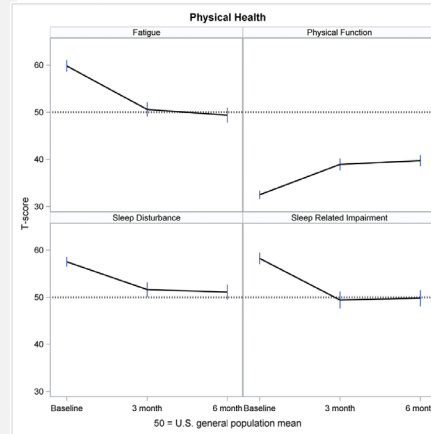


Fig. 2. Physical health over time.

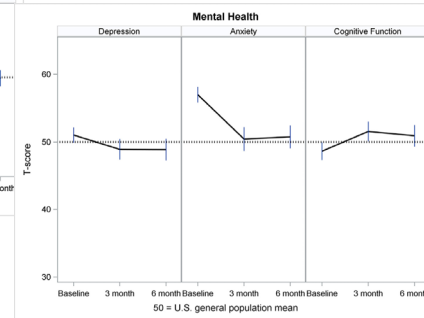


Fig. 3. Mental health over time.

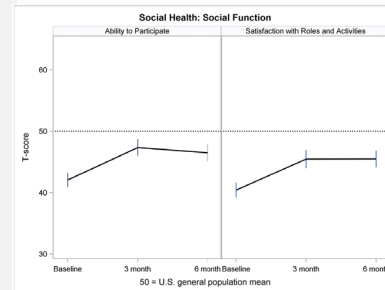


Fig. 4. Social health: social function over time.

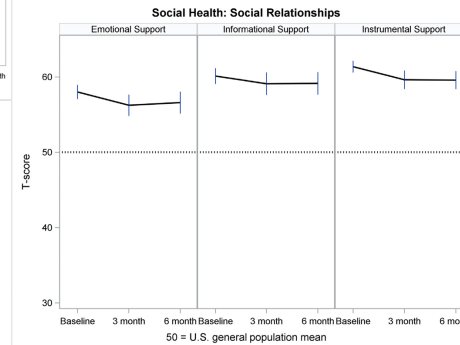


Fig. 5. Social health: social relationships over time.

Reviewer’s Comments

- PROMIS measures are used in multiple chronic illnesses and allow for comparison to the general population, thus can help monitor for return to “normalcy” post-implant.
- In this study, several PROMIS measures improved to the mean of the general population 3-months post-transplant.
- Use of PROMIS measures may compliment the shared decision-making process with patients by highlighting potential benefits post-implant and to monitor positive/negative changes post-implant to better address key areas important to patient well-being.

Limitations

- The study lacked diversity, with the majority of the studied population being male, non-Hispanic white, well educated, and married.
- There was only 6-month follow-up; longer follow-up is needed to assess meaningful PRO changes over time.
- Only 35% of participants completed all 3 assessments, however state-of-the-science methods for missing data allowed use of data from 92% of participants.