The influence of screening on identification of behavioral health issues: A causal analysis

Kerrin Gallagher, MPH[1], Anita Morris, MSN, FNP-BC[2], Jessica Rosenberg, MPH[2] and Chris Sheldrick, PhD[2,3]

(1) Boston University School of Public Health, Boston, MA, (2) TEAM UP for Children, Boston Medical Center, Boston, MA, (3) UMass Chan Medical School, Worcester, MA

TEAM UP | SCALING & SUSTAINABILITY CENTER™

BACKGROUND:

- Developmental and behavioral screening is widely recommended, yet there is little direct evidence how it influences real-world clinical decision-making or that its effects are equitable
- Though less common than randomized controlled trials, regression discontinuity (RD) is widely accepted for supporting causal hypotheses
- RD can determine whether positive screens influence clinical decisions

METHODS:

Study Context: Transforming and Expanding Access to Mental Health Universally in Pediatrics (TEAM UP), an initiative to facilitate integrated behavioral health (BH) care at federally qualified health centers

Data: Electronic medical records (EMR) between June 2020 to April 2023.

Inclusion criteria:

(a) Pediatric Symptom Checklist (PSC-17) score

(b) TEAM UP behavioral health plan, a standard EMR template indicating whether a BH concern was identified by the primary care provider.

ANALYSIS:

- Logistic regression: analyze associations between total screening scores and probability of identification
- Regression Discontinuity: evaluate whether there was a sudden increase (i.e., discontinuity) in the probability of identification as screening scores cross the threshold from negative to positive
- Stratification by language

RESULTS:

Across 15,441 observations, logistic regression revealed a strong association between screening scores and identification of BH issues (Table 1) and the proportion of patients with issues identified rose steadily with the PSC-17 scores (Figure 1).

Table 1. Logistic Regression Results

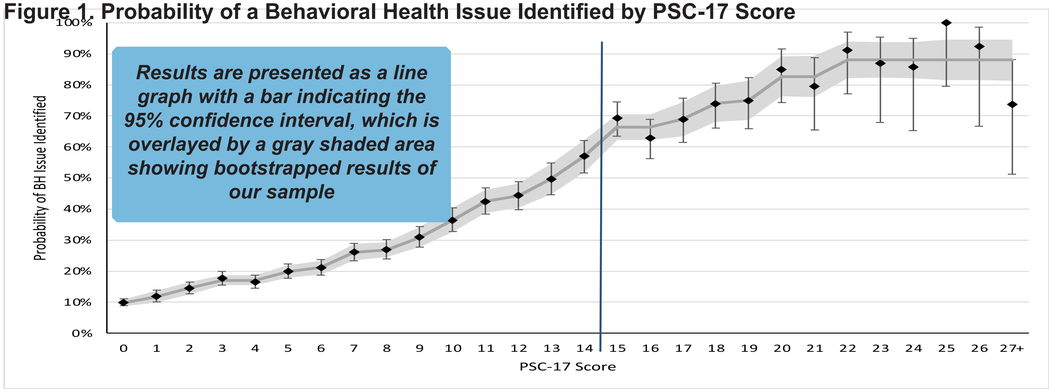
Analysis Group	Coefficient	Standard Error	P-Value	95% Confidence Interval
Overall	0.18	0.0040	<0.001	0.17, 0.18
English Speakers	0.24	0.0052	<0.001	0.23, 0.25
Non-English Speakers	0.26	0.0041	<0.001	0.26, 0.27

This association was stronger for English speakers compared to non-English speakers. However, regression discontinuity analysis revealed that the influence of positive/negative screening threshold on identification of BH issues was not statistically significant (Table 2). While results for both English and non-English speakers were again non-significant, there was a trend toward a stronger effect of screening among English speakers.

Table 2. Regression Discontinuity Results

Analysis Group	Coefficient	Standard Error	P-Value	95% Confidence Interval
Overall	0.046	0.046	0.31	-0.044, 0.14
English Speakers	0.054	0.048	0.26	-0.039, 0.15
Non-English Speakers	-0.011	0.086	0.90	-0.18, 0.16

Figure 1. Probability of a Behavioral Health Issue Identified by PSC-17 Score



CONCLUSION

Screening scores were associated with identification of behavioral health issues via logistic regression.

However, regression discontinuity analyses failed to demonstrate a causal effect of positive/negative results defined by screening thresholds.

While primary care practitioners may glean information from continuous scores, results suggest that cut scores may have little influence on decision-making.

Modifying cut scores to be more applicable to real-world clinical decisions may be warranted.

teamupforchildren.org

TEAM UP has been developed with funding from the Richard and Susan Smith Family Foundation and The Klarman Family Foundation in collaboration with participating practices.

teamupforchildren@bmc.org