

# Teamwork Enhances Patient Experience: Linking TEAM and Net Promoter Scores

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The term *patient experience* refers to “the sum of all interactions shaped by an organization’s culture that influence patient perceptions across the continuum of care.”<sup>1</sup> Patient experience is identified as a goal within the Institute for Healthcare Improvement’s Quadruple Aim framework.<sup>2</sup> Including patient experience as a health care outcome presents a multifaceted phenomenon for benchmarking continuous performance improvement.<sup>3</sup> One method to achieve reliable measurement is using the single-item patient Net Promoter Score (NPS). Created in 2003, NPS is used in industries such as banking, insurance, and technology.<sup>4</sup> Recently, NPS has been adopted into health care settings as a surveying method for system-level benchmarking.<sup>5</sup> “NPS” in this article will consistently refer to patient NPS.

The components of what can lead to patient experience, patient engagement, and enrollment remain elusive. In particular, relationships among provider experiences, work environments, and patient experiences are understudied and undervalued.<sup>6</sup> Although the contributions of the work environment to provider burnout are well known, the relationship this has to patient outcomes requires further study.<sup>6</sup> We recently described a novel 6-item teamwork measure, herein referred to as TEAM (emphasizing efficiency, communication, continuous improvement, and leadership) and reported relationships between TEAM and 3 provider outcomes: (1) provider experience, (2) burnout, and (3) intent to stay with the organization.<sup>7</sup> Because other recent work from our team demonstrates that patient experience is most strongly related to the connection with their individual provider,<sup>8</sup> it is unclear whether strong teamwork will relate to favorable patient outcomes, in particular, the NPS that quantifies patients’ willingness to refer their family and friends to the organization. We used data from Optum’s biannual provider experience survey to determine whether (1) TEAM (teamwork) and provider experience are related to higher patient NPS and (2) the provider experience–NPS relationship is mediated, in part, by teamwork.

## METHODS

The Optum TEAM project has been described in detail elsewhere.<sup>7</sup> In brief, a validated survey is administered in 11 care delivery

## ABSTRACT

**OBJECTIVES:** We previously described a 6-item teamwork index (TEAM) with a strong relationship to provider experience, lower burnout, and intent to stay. We now sought to determine whether (1) TEAM relates to higher patient Net Promoter Score (NPS, or likelihood of patient referring to the organization) and (2) teamwork mediates a provider experience–NPS relationship.

**STUDY DESIGN:** A provider wellness survey was administered in the fall of 2019 in 6 care delivery organizations (CDOs) with patient NPS data.

**METHODS:** Measures included a validated burnout item, 6-item TEAM measure, provider experience metric, standard intent-to-stay question, and NPS data from 79,254 patients matched to CDO. Regression analyses modeled relationships among TEAM, provider experience, and NPS. Open-ended comments were reviewed to confirm patient NPS findings.

**RESULTS:** There were 1386 provider respondents (53% physicians, 47% advanced practice clinicians, 58% female, 62% White, 58% in primary care; response rate, 55.7%). Median NPS was 83%. TEAM was associated with patient NPS greater than the median (53% with high TEAM and high NPS vs 44% with low TEAM and high NPS;  $P < .001$ ), as was provider experience (52% vs 45%;  $P < .05$ ). In regression analyses, patient NPS was strongly related to TEAM (adjusted OR, 1.41; 95% CI, 1.25–1.60;  $P < .001$ ). The provider experience–patient NPS relationship was partly mediated by TEAM. Open-ended comments confirmed positive or negative sentiments related to NPS.

**CONCLUSIONS:** Teamwork and provider experience relate to patient NPS, and the provider experience–NPS relationship appears to be mediated by teamwork.

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organizations (CDOs) twice annually, assessing known predictors of work-life integration, such as chaotic environments, undue administrative burden, control of workload, organizational culture, and challenges with electronic record use. The current study utilized data from the fall 2019 provider survey. Burnout is measured with a validated single-item metric<sup>9,10</sup> most closely linked to the emotional exhaustion subscale of the Maslach Burnout Inventory. Teamwork is measured with 6 items emphasizing efficiency, communication, quality improvement, and leadership. The TEAM index is most strongly related to provider experience (57% of variance explained) and significantly related to burnout and intent to stay. TEAM, provider experience, and single-item burnout measures<sup>11</sup> are presented in the **eAppendix** (available at [ajmc.com](http://ajmc.com)).

In the current study, we added a new dimension of patient experience as reflected in the NPS. The NPS question asks how likely a patient is to recommend a medical practice to others; it is scored from 0 to 10. Highly favorable scores (9 and 10) indicate “promoters,” moderate scores (7 and 8) indicate “passives,” and lower scores (0 through 6) indicate “detractors.” The NPS subtracts the percent detractors from the percent promoters and can range from -100% to 100%. In a medical practice, negative NPS ratings are very unusual. In this case, there was only 1 provider with a negative NPS; this NPS was dropped from the analysis as an outlier. (A sensitivity analysis showed that its inclusion in the model had little impact on the regression coefficients.) Analyzed NPS ratings thus ranged from 0 to 100. Average NPS ratings per each provider were available for analysis.

### Quantitative Analysis

We used data from the 6 CDOs with full NPS and provider data. We began by assessing correlations among provider experience, burnout, intent to stay, teamwork, and mean NPS per provider. We then performed hierarchical logistic regressions controlling for clustering of clinicians and patients within CDOs, as well as age, gender, and other provider demographic variables. Finally, we assessed mediation of relationships between teamwork and patient NPS by separately performing regressions for provider experience on the patient experience, answering the question of whether relationships between patient NPS and provider experience variables (experience, burnout, and intent to stay) were mediated in part by teamwork. The analysis<sup>12</sup> used the following framework for generalized estimating equation (GEE) models:

- **Exposure:** existing TEAM scores (binary variable)
- **Outcome:** mean NPS per provider (percent score and continuous variable)
- **Clustering variable:** CDO (same CDOs as referred to in Nguyen Howell et al<sup>7</sup>)

### TAKEAWAY POINTS

In 1386 providers responding to a biannual wellness survey (53% physicians, 58% female, 62% White, 58% primary care; response rate, 56%):

- ▶ Patient Net Promoter Score (NPS) was associated with a 6-item teamwork index (TEAM); 53% had high TEAM and high NPS vs 44% with low TEAM and high NPS ( $P < .001$ ).
- ▶ Odds of favorable NPS were 41% higher if TEAM score was greater than the median ( $P < .001$ ).
- ▶ The provider experience–NPS relationship was partly mediated by TEAM.

Teamwork is a critically important aspect of provider work life; a brief measure, TEAM, correlates with favorable provider and patient experience.

• **Other covariates:** including age, gender, race/ethnicity (White vs non-White), provider type (physician vs advanced practice clinician), years in practice (5-year increments), primary care (general internal medicine, family medicine, pediatrics, medicine pediatrics vs subspecialty care), CDO, and acquisition status (CDO acquired within 2 years of survey, more than 2 years before survey, or not acquired); these are similar to adjusting covariates used in Nguyen Howell et al.<sup>7</sup>

We thus assessed via 2 paths the “total effect” of teamwork (TEAM) in terms of patient experience (as measured by patient NPS) while exploring the possibility of mediation, regarding provider experience, burnout, and intent to stay, as follows:

TEAM measure → patient experience (NPS)

Provider experience, burnout, intent to stay  
→ TEAM → patient experience (NPS)

In the analyses, a  $P$  value less than .05 was considered significant. Percent variance explained in the above outcomes was reported as  $R^2$  or pseudo  $R^2$ , as appropriate.<sup>13</sup>

### Qualitative Analysis

Qualitative analysis was performed on patient responses to the question, “Why did you give the rating that you did for likelihood to recommend this organization?” after patients rated their visit (79,254 valid responses received within 6 CDOs). The NPS data set included patients in all 50 states plus the District of Columbia sampled in fall and winter of 2019 into 2020. We primarily focused on comments from (1) promoters giving an NPS of 9 or 10 and (2) detractors giving an NPS of 0 to 6. Comments were reviewed by an author (E.S.) to categorize whether the sentiment expressed was positive or negative and whether it was aligned with the NPS. Major themes expressed by the promoter (high-NPS) and detractor (lower-NPS) groups were also identified.

## RESULTS

We studied 1386 providers (53% physicians, 47% advanced practice clinicians) from the Optum provider experience survey in fall 2019 (response rate, 55.7%). These providers came from 6 CDOs with

**TABLE 1.** Demographics of 1386 Providers in the Optum Provider Experience Survey, Fall 2019

| Outcome                                      | Total N |      | TEAM index < median |      | TEAM index ≥ median |      | TEAM index ≥ median vs TEAM index < median |                         |
|--|---------|------|---------------------|------|---------------------|------|--|-------------------------|
|  | n       | %    | n                   | %    | n                   | %    | P  | Standardized difference |
| Cohort n                                     | 1386    | 100  | 675                 | 48.7 | 711                 | 51.3 |  |                         |
| Provider type                                |         |      |                     |      |                     |      |  |                         |
| Advanced practice clinician                  | 657     | 47.4 | 350                 | 51.9 | 307                 | 43.2 | .001                                       | -0.17                   |
| Physician (MD)                               | 729     | 52.6 | 325                 | 48.2 | 404                 | 56.8 | <.001                                      | 0.17                    |
| Specialty                                    |         |      |                     |      |                     |      |  |                         |
| Primary care                                 | 801     | 57.8 | 359                 | 53.2 | 442                 | 62.2 | <.001                                      | 0.18                    |
| Subspecialty care                            | 585     | 42.2 | 316                 | 46.8 | 269                 | 37.8 | <.001                                      | -0.18                   |
| Age group in years                           |         |      |                     |      |                     |      |  |                         |
| < 30   | 61      | 4.4  | 31                  | 4.6  | 30                  | 4.2  | .74  | -0.02                   |
| 30-34  | 160     | 11.5 | 82                  | 12.1 | 78                  | 11.0 | .49  | -0.04                   |
| 35-39  | 209     | 15.1 | 106                 | 15.7 | 103                 | 14.5 | .59  | -0.03                   |
| 40-44  | 177     | 12.8 | 80                  | 11.9 | 97                  | 13.6 | .32  | 0.05                    |
| 45-49  | 235     | 17.0 | 111                 | 16.4 | 124                 | 17.4 | .62  | 0.03                    |
| 50-54  | 156     | 11.3 | 71                  | 10.5 | 85                  | 12.0 | .40  | 0.05                    |
| 55-59  | 162     | 11.7 | 86                  | 12.7 | 76                  | 10.7 | .24  | -0.06                   |
| ≥ 60   | 226     | 16.3 | 108                 | 16.0 | 118                 | 16.6 | .76  | 0.02                    |
| Gender                                       |         |      |                     |      |                     |      |  |                         |
| Female                                       | 797     | 57.5 | 414                 | 61.3 | 383                 | 53.9 | .005                                       | -0.15                   |
| Male   | 589     | 42.5 | 261                 | 38.7 | 328                 | 46.1 | .005                                       | 0.15                    |
| Ethnicity                                    |         |      |                     |      |                     |      |  |                         |
| White  | 857     | 61.8 | 467                 | 69.2 | 390                 | 54.9 | <.001                                      | -0.30                   |
| Asian  | 170     | 12.3 | 61                  | 9.0  | 109                 | 15.3 | <.001                                      | 0.19                    |
| Black/Hispanic/other                         | 359     | 25.9 | 147                 | 21.8 | 212                 | 29.8 | <.001                                      | 0.18                    |
| Tenure at organization in years              |         |      |                     |      |                     |      |  |                         |
| < 1  | 249     | 18.0 | 106                 | 15.7 | 143                 | 20.1 | .03  | 0.12                    |
| 1-4  | 598     | 43.2 | 314                 | 46.5 | 284                 | 39.9 | .01  | -0.13                   |
| 5-9  | 231     | 16.7 | 126                 | 18.7 | 105                 | 14.8 | .05  | -0.11                   |
| ≥ 10   | 308     | 22.2 | 129                 | 19.1 | 179                 | 25.2 | .007                                       | 0.15                    |
| Acquisition status                           |         |      |                     |      |                     |      |  |                         |
| Not acquired                                 | 1015    | 73.2 | 483                 | 71.6 | 532                 | 74.8 | .17  | 0.07                    |
| Acquired within 2 years of survey            | 137     | 9.9  | 67                  | 9.9  | 70                  | 9.9  | .95  | 0.00                    |
| Acquired more than 2 years before survey     | 234     | 16.9 | 125                 | 18.5 | 109                 | 15.3 | .11  | -0.09                   |
| Provider outcomes                            |         |      |                     |      |                     |      |  |                         |
| Provider experience <sup>a</sup> (index ≥ 4) | 723     | 52.2 | 161                 | 23.9 | 562                 | 79.0 | <.001                                      | 1.32                    |
| Burnout <sup>b</sup> (score ≤ 3)             | 415     | 29.9 | 294                 | 43.6 | 121                 | 17.0 | <.001                                      | -0.60                   |
| Intent to stay (score ≥ 4)                   | 1097    | 79.2 | 438                 | 64.9 | 659                 | 92.7 | <.001                                      | 0.72                    |

<sup>a</sup>Higher indicates better team experience.

<sup>b</sup>Lower indicates more burnout.

complete NPS data in 2019, covering approximately the same time period. Of these providers, 58% were female; 62% were White and the remaining 38% were providers of color (Asian, Black, Hispanic, or

other). Primary care providers comprised 58% of the sample, and 61% were younger than 50 years (Table 1). NPS data were collected from a range of 1 to 758 patients per provider in the 6 CDOs. There were 79,254 patients surveyed, aged 1 to 108 years, with 60.3% (n = 52,657) female. In this data set with open-ended comments, as well as with comparable data sets, response rates vary between 5% and 20% depending upon geography and survey mode. TEAM scores greater than the median were most often found in primary care providers (P < .01), men (P < .01), and providers of color (P < .01); analyses by row percentages are included in the eAppendix Table. Of the 1386 respondents, 29.9% had burnout, and 79.2% intended to stay with the organization. Median NPS was 83. High NPS (≥ median) was significantly associated with TEAM (53% with high TEAM score and high NPS vs 44% with low TEAM score and high NPS; P < .001); in continuous scoring, mean NPS was 78 in those with low TEAM scores vs 81 in those with high TEAM scores (P = .001) (Table 2).

The Figure (A and B) shows histograms of TEAM scores and NPS. The eAppendix Figure demonstrates outcomes of NPS by TEAM score being low vs high.

Table 3 provides bivariate comparisons of TEAM with 3 proposed contributors to NPS: provider experience, burnout, and intent to stay. Provider experience was related to NPS: Of those with high provider experience scores, 52% had NPS above median vs 45% having high NPS with low provider experience scores (P = .02). Burnout was not related to high NPS, whereas intent to stay had a borderline association (ie, of those with a high intent to stay, 50% had a high NPS vs only 44% having a high NPS in those not intending to stay) (P = .08).

Table 4 shows hierarchical regressions, including adjusted ORs (AORs) of having high NPS based upon hypothesized contributors. The first row shows adjusted odds of high NPS as a function of TEAM (1.41, or 41% higher odds of favorable NPS if TEAM > median; 95% CI, 1.25-1.60; P < .001). R<sup>2</sup> for the models showed that less than 10% of NPS variance was explained by TEAM in the following GEE:

$$\text{TEAM measure} \rightarrow \text{patient experience (NPS)}$$

Table 4 reports a mediation analysis (considered as exploratory in this cross-sectional study), including AORs for provider experience,

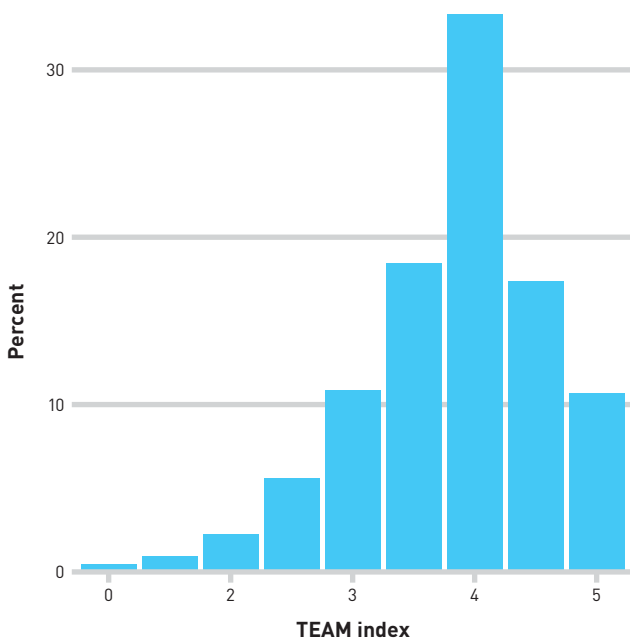
**TABLE 2.** NPS by TEAM Index

| NPS by TEAM index                | Total N     |           | TEAM index < median |           | TEAM index ≥ median |           | P     | Standardized difference: provider experience ≥ 4 vs provider experience < 4 |
|----------------------------------|-------------|-----------|---------------------|-----------|---------------------|-----------|-------|---|
|                                  | n           | %         | n                   | %         | n                   | %         |       |   |
| <b>NPS as binary</b>             |             |           |                     |           |                     |           |       |   |
| Low NPS, binary (< median [83%]) | 713         | 51.4      | 381                 | 56.4      | 332                 | 46.7      | <.001 | -0.2  |
| High NPS, binary (≥ median)      | 673         | 48.6      | 294                 | 43.6      | 379                 | 53.3      | <.001 | 0.2   |
| <b>NPS, continuous</b>           | <b>Mean</b> | <b>SD</b> | <b>Mean</b>         | <b>SD</b> | <b>Mean</b>         | <b>SD</b> |       |   |
| NPS, continuous                  | 79.3        | 16.02     | 77.9                | 16.04     | 80.7                | 15.9      | .001  | 0.18  |

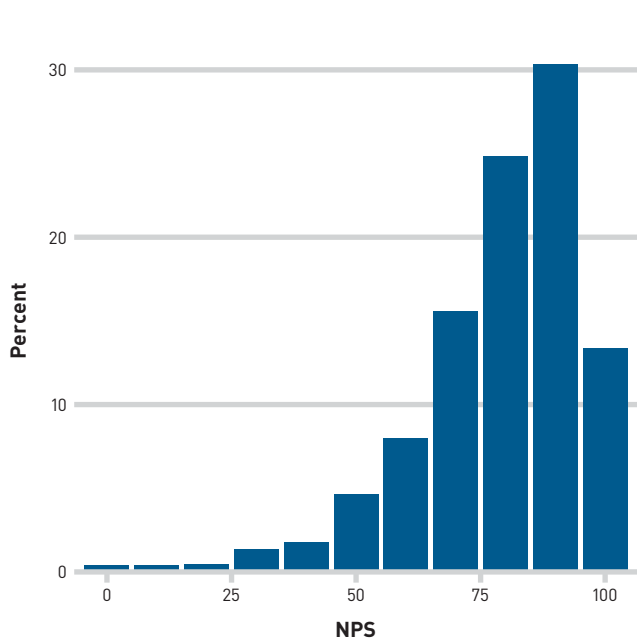
NPS, Net Promoter Score.

**FIGURE.** TEAM Scores and NPS

**A.** Histogram of TEAM scores (adapted from Nguyen Howell et al<sup>7</sup>)



**B.** Histogram of NPS\*



NPS, Net Promoter Score.

\*Higher indicates better patient experience.

burnout, and intent to stay in relation to NPS. Burnout and intent to stay had minor impact on the model in terms of mediation, but odds declined substantively (64% decline in  $\beta$  coefficient) when provider experience was added to the model, suggesting the TEAM index mediates the relationship between provider experience and NPS in the GEE model:

Provider experience, burnout, intent to stay  
 → TEAM → patient experience (NPS)

The mediation analysis with provider experience and TEAM explained 9% of NPS variance.

Qualitative analysis demonstrated mostly positive sentiments in the promoters (NPS = 9 or 10). Main themes in promoters included

excellent care, good service, caring doctors, and friendly staff. Comments in detractors (NPS = 0 to 6) revealed negative sentiments in respondents answering the NPS question with a 0 to 5, whereas sentiments of those who answered with a 6 contained a mix of positives and negatives. Major themes expressed by detractors included wait times for appointments or referrals, long waits during the visits, concerns about short staffing, inability to see their usual doctor, and billing issues.

## DISCUSSION

In this study of 1386 clinicians in a large group practice organization, we assessed relationships between a novel teamwork measure

**TABLE 3.** Continuous NPS by 3 Provider Outcomes: Provider Experience, Burnout, and Intent to Stay

| Provider experience              | Total |      | Provider experience < 4 |      | Provider experience ≥ 4 |      | P    | Standardized difference: provider experience ≥ 4 vs provider experience < 4 |
|----------------------------------|-------|------|-------------------------|------|-------------------------|------|------|---|
|                                  | n     | %    | n                       | %    | n                       | %    |      |   |
| Low NPS, binary (< median [83%]) | 713   | 51.4 | 375                     | 54.8 | 338                     | 48.4 | .018 | -0.13   |
| High NPS, binary (≥ median)      | 673   | 48.6 | 300                     | 45.3 | 373                     | 51.6 | .018 | 0.13  |
|                                  | Mean  | SD   | Mean                    | SD   | Mean                    | SD   |      |   |
| NPS, continuous                  | 79.3  | 16.0 | 78.06                   | 16.2 | 80.43                   | 15.8 | .006 | 0.15  |

| Burnout                     | Total |      | Burnout ≤ 3 |      | Burnout > 3 |      | P    | Standardized difference: provider experience ≥ 4 vs provider experience < 4 |
|-----------------------------|-------|------|-------------|------|-------------|------|------|---|
|                             | n     | %    | n           | %    | n           | %    |      |   |
| Low NPS, binary (< median)  | 713   | 51.4 | 206         | 51.7 | 507         | 50.8 | .77  | -0.02   |
| High NPS, binary (≥ median) | 673   | 48.6 | 469         | 48.3 | 204         | 49.2 | .77  | 0.02  |
|                             | Mean  | SD   | Mean        | SD   | Mean        | SD   |      |   |
| NPS, continuous             | 79.3  | 16.0 | 79.28       | 15.8 | 79.35       | 16.6 | .943 | 0.00  |

| Intent to stay              | Total |       | Intent to stay ≤ 3 |       | Intent to stay > 3 |       | P    | Standardized difference: provider experience ≥ 4 vs provider experience < 4 |
|-----------------------------|-------|-------|--------------------|-------|--------------------|-------|------|---|
|                             | n     | %     | n                  | %     | n                  | %     |      |   |
| Low NPS, binary (< median)  | 713   | 51.4  | 548                | 56.1  | 165                | 50.2  | .078 | -0.12   |
| High NPS, binary (≥ median) | 673   | 48.56 | 127                | 43.94 | 546                | 49.77 | .078 | 0.12  |
|                             | Mean  | SD    | Mean               | SD    | Mean               | SD    |      |   |
| NPS, continuous             | 79.3  | 16.0  | 78.46              | 15.5  | 79.52              | 16.1  | .321 | 0.07  |

NPS, Net Promoter Score.

**TABLE 4.** Adjusted Models Assessing Mediation of Provider Work Conditions and Outcomes on NPS as a Function of TEAM Score<sup>a</sup>

| Model                                | Label   | Adjusted OR | 95% OR LCL | 95% OR UCL | P     | Change in unexponentiated β suggestive of mediation | Note  | Pseudo R <sup>2b</sup> |
|--------------------------------------|---|-------------|------------|------------|-------|---|---|------------------------|
| Total effects GEE model              | Odds of high NPS, as a function of TEAM index               | 1.41        | 1.25       | 1.60       | <.001 |   | TEAM index predicting NPS                                   | 0.09                   |
| Mediators effect GEE model           | Odds of high NPS, as a function of high provider experience | 1.27        | 1.04       | 1.55       | .02   |   | Excluding TEAM index; provider experience is predictor      | 0.09                   |
|                                      | Odds of high NPS, as a function of low burnout <sup>c</sup> | 1.04        | 0.87       | 1.24       | .71   |   |   |                        |
|                                      | Odds of high NPS, as a function of high intent to stay      | 0.98        | 0.79       | 1.23       | .88   |   |   |                        |
| Total and mediators effect GEE model | Odds of high NPS, as a function of TEAM index               | 1.39        | 1.20       | 1.59       | <.001 | 6%  | TEAM index + provider experience + burnout + intent to stay | 0.09                   |
|                                      | Odds of high NPS, as a function of high provider experience | 1.09        | 0.84       | 1.41       | .51   | 64%   |   |                        |
|                                      | Odds of high NPS, as a function of low burnout <sup>c</sup> | 1.05        | 0.88       | 1.25       | .62   | Nonsignificant mediator association                 |   |                        |
|                                      | Odds of high NPS, as a function of high intent to stay      | 0.95        | 0.78       | 1.16       | .62   | Nonsignificant mediator association                 |   |                        |

GEE, generalized estimating equation; LCL, lower confidence limit; NPS, Net Promoter Score; UCL, upper confidence limit.

<sup>a</sup>Adjustments: clustering by care delivery organization and the following covariates: provider type, provider specialty, sex, age, race/ethnicity, tenure at organization, acquisition status. Outcome is binary and models are not weighted for the number of valid NPS measurements.

<sup>b</sup>Generalized linear models pseudo R<sup>2</sup> was calculated using the proposed methodology by Zhang<sup>12</sup> based on predefined variance function for binomial distribution.

<sup>c</sup>Lower value indicates more burnout.

(TEAM) and a commonly used patient experience loyalty metric (NPS). We also assessed whether relationships between provider experience metrics (overall experience, burnout, and intent to stay) and NPS are mediated by teamwork. The findings show a strong relationship between teamwork and NPS, and a meaningful relationship between provider experience and NPS. We detected a potential mediating effect of teamwork on the provider experience–patient NPS relationship. These findings have real-world relevance as they determine how experiences of the team and providers may shape outcomes for patients—in this case, the industry standard of patients' willingness to refer others to their medical practice.

Potential causes of the association between teamwork and NPS lie within the entire clinic working as a cohesive unit to support patients' needs. There are more opportunities to care holistically for patients when their needs are not lost or delayed in a well-functioning system. Detractors in NPS often endure a service failure and when that occurs, high-functioning teams are able to recover the patient concern and build further rapport with patients and families.

Aligning this research with teamwork in office practices, we could reimagine a way to deliver care to patients that values what they need while also fulfilling providers' professional goals. By focusing on teamwork and provider experience, our data suggest an organization could improve patient experience and, if confirmed in longitudinal studies, patient enrollment. By addressing what matters to patients, practices may design care processes to satisfy patient needs for quality health care.

The literature suggests NPS may be a proxy for patient experience, with relatively strong correlations (0.4-0.7) between other patient experience metrics and NPS.<sup>14</sup> A systematic review found 12 high-quality studies of NPS with reasonable usefulness for NPS as an expression of patient experience.<sup>3</sup> NPS may be used in a wide variety of patients, including those with low health literacy<sup>15</sup> and in children.<sup>16</sup> Moreover, NPS shows high completion rates during standard surveying.<sup>4</sup>

The literature suggests using open-ended comments to complement NPS<sup>3,17</sup>; indeed, we found that among the many patient comments, NPS reflected patients' experiences. Promoters generally had pleasant experiences; comments reflected compliments about doctors, staff, service, and care quality. Detractors typically had negative experiences, and comments noted frustration with various visit components. In the orthopedic literature, NPS provided favorable effects in distinguishing responses to varied joint surgeries,<sup>4</sup> with ORs relating NPS to hospital experience somewhat greater than ours. Some challenges in using NPS include respondents from diverse cultures ranking NPS differently.<sup>3</sup> Thus, there may be substantial variability in how NPS ratings are ascribed, a finding that may strengthen our results of significant relationships of TEAM and NPS despite this variation in how patients decide on a high NPS. In the systematic review of 12 eligible studies, and in related literature, NPS had numerous benefits, including being understood by a wide range of patients<sup>3,15,16</sup> and eliciting many responses.<sup>18,19</sup> The systematic review finds that NPS may be more appropriate in

settings where patients can choose and select their own providers.<sup>3,19</sup> This is especially true in value-based care models (as described in a Health Care Payment Learning & Action Network publication<sup>20</sup>).

Our main finding is that a high TEAM score was associated, even after adjustment in hierarchical models, with NPS (41% greater odds of favorable NPS if TEAM score high;  $P < .001$ ). To our knowledge, this is the first demonstrated relationship between NPS and teamwork using a brief, validated,<sup>7</sup> "off-the-shelf" teamwork metric. Another new finding is that provider experience relates to NPS. Finally, the provider experience relationship to NPS appears to be mediated in part by the TEAM score. These findings provide strong endorsement for emphasis on team-based care, especially in value-based care models where patients are able to choose their provider to ensure that more accountable, coordinated care is delivered.<sup>20</sup>

Burnout played a minor role in the development of a favorable NPS. This is supported by prior findings<sup>6,21</sup> that providers under stress strive to provide high-quality care and, if they perceive that adverse work conditions make preservation of quality care impossible, they are likely to leave the organization. This "provider as buffer" hypothesis (buffering the patient from a challenging system) supports the cost-effectiveness of burnout reduction programs to improve provider mental health and retention. This reflects that burnout, although not directly linked to NPS, represents the effects of an adverse work environment and should be addressed to prevent provider disengagement and resignation, which are expensive (\$250,000-\$500,000 per physician<sup>22</sup>) and produce untoward outcomes.

### Strengths and Limitations

Our study has both strengths and limitations. The clinician response rate was high at 55.7% (although the patient response rate for NPS was lower, between 5% and 20%), and the CDOs were spread across the entire country. Many of the measures have been validated previously<sup>7</sup> in connection with reliable burnout metrics, which would include the single-item measure we use in the Optum provider experience surveys, as well as the Maslach Burnout Inventory. As limitations, we note the inability to obtain granular patient-level data; thus, we relied on average NPS per provider, with a chance for bias in NPS reporting due to sampling, format, and time from patient experience. Our exploratory mediation analysis is suggestive of the effect of provider experience on NPS being partially mediated through teamwork; however, this assumes changes in TEAM temporally follow changes in provider experience (which cannot be determined in a cross-sectional study). The open-ended comments confirm the directionality of the NPS but do not speak to health care outcomes, which should be assessed in future studies. Finally, the amount of NPS variance explained by TEAM is relatively low, suggesting that other variables (such as patients' experiences with their own providers, as in Khullar et al<sup>8</sup>) also play meaningful roles in how patients determine NPS.

There are implications for action. Coupled with our recent research relating TEAM to lower burnout, better provider experience, and greater intent to stay,<sup>7</sup> this new article supports building better teams, using



the TEAM index as an indicator to track progress in strengthening both provider and patient experiences. Aspects of high-performing teams include efficiency, cohesion, communication, and leadership. Building these cultural aspects into teams may provide a higher likelihood of success. Future studies are planned to evaluate this hypothesis with a “toolkit trial,” prospectively assessing impact of high-performing teams on provider experience, burnout, intent to stay, and patient outcomes, including NPS. At a time when primary care has suffered from effects of a global pandemic,<sup>23</sup> team-building may be a bright spot that all can gladly focus on. With an emphasis on a call to action for application of this research, we hope the TEAM toolkit trial will replicate what high-functioning teams do in areas of the organization that may benefit from stronger teamwork. Our continued research on team-based care will advance both patient and provider experiences.

## CONCLUSIONS

Teamwork is strongly correlated with NPS. Our efforts to bolster teamwork, supporting efforts that have been ongoing in health care for many years, add momentum to the imperative to strengthen both provider and patient experiences. By teams addressing what is meaningful to patients, we may redesign a clinical practice that fulfills providers' needs and offers a gratifying patient experience. Formal trials to improve teamwork with measurement of provider and patient outcomes should be pursued as a result of this research. ■

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JR); administrative, technical, or logistic support (ANH, DW, SP, MS, ML); and supervision (ANH, MS, ML).

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**eAppendix Table.** Cohort characteristics by low vs. high TEAM Index (row percents provided)

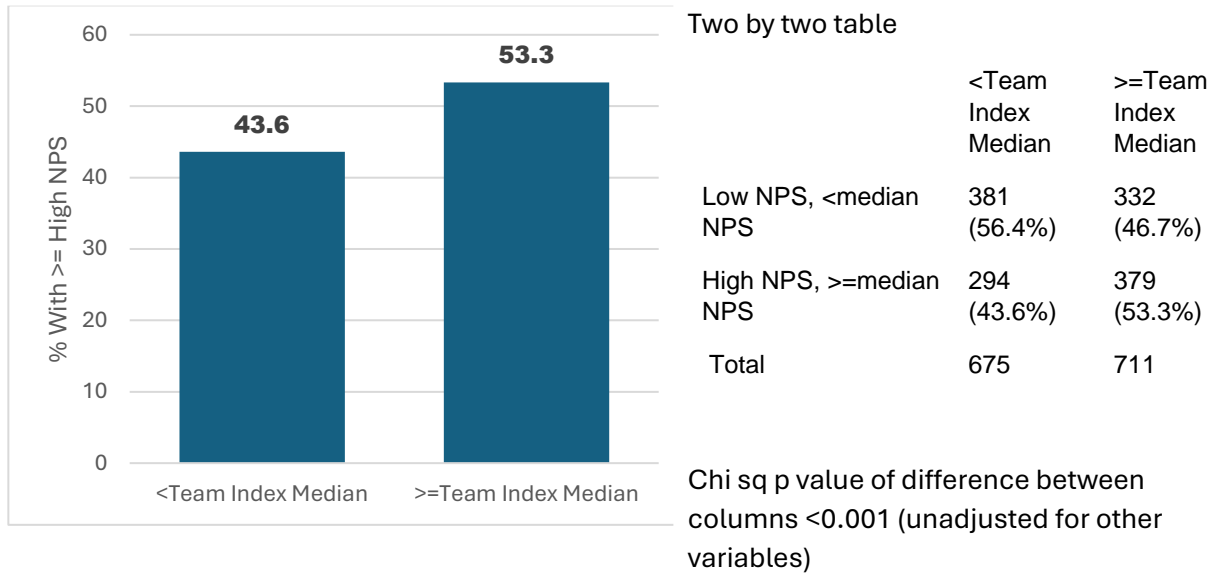
| N = 1386                        | Total N |        | <TEAM Index Median |       | ≥TEAM Index Median |       |         |
|---------------------------------|---------|--------|--------------------|-------|--------------------|-------|---------|
| Outcome                         | N       | row %  | N                  | row % | N                  | row % | P-Value |
|                                 | 1,386   | 100    | 675                | 48.7  | 711                | 51.3  |         |
| <b>Provider Type</b>            |         |        |                    |       |                    |       |         |
| Advanced Practice Clinician     | 657     | 100.0% | 350                | 53.3% | 307                | 46.7% | 0.001   |
| Physician (MD)                  | 729     | 100.0% | 325                | 44.6% | 404                | 55.4% | <0.001  |
| <b>Specialty</b>                |         |        |                    |       |                    |       |         |
| Primary Care                    | 801     | 100.0% | 359                | 44.8% | 442                | 55.2% | <0.001  |
| Subspecialty Care               | 585     | 100.0% | 316                | 54.0% | 269                | 46.0% | <0.001  |
| <b>Age Group</b>                |         |        |                    |       |                    |       |         |
| < 30                            | 61      | 100.0% | 31                 | 50.8% | 30                 | 49.2% | 0.74    |
| 30-34                           | 160     | 100.0% | 82                 | 51.3% | 78                 | 48.8% | 0.49    |
| 35-39                           | 209     | 100.0% | 106                | 50.7% | 103                | 49.3% | 0.59    |
| 40-44                           | 177     | 100.0% | 80                 | 45.2% | 97                 | 54.8% | 0.32    |
| 45-49                           | 235     | 100.0% | 111                | 47.2% | 124                | 52.8% | 0.62    |
| 50-54                           | 156     | 100.0% | 71                 | 45.5% | 85                 | 54.5% | 0.40    |
| 55-59                           | 162     | 100.0% | 86                 | 53.1% | 76                 | 46.9% | 0.24    |
| 60+                             | 226     | 100.0% | 108                | 47.8% | 118                | 52.2% | 0.76    |
| <b>Gender</b>                   |         |        |                    |       |                    |       |         |
| Female                          | 797     | 100.0% | 414                | 51.9% | 383                | 48.1% | 0.005   |
| Male                            | 589     | 100.0% | 261                | 44.3% | 328                | 55.7% | 0.005   |
| <b>Ethnicity</b>                |         |        |                    |       |                    |       |         |
| White                           | 857     | 100.0% | 467                | 54.5% | 390                | 45.5% | <0.001  |
| Asian                           | 170     | 100.0% | 61                 | 35.9% | 109                | 64.1% | <0.001  |
| Black/Hispanic/Other            | 359     | 100.0% | 147                | 40.9% | 212                | 59.1% | <0.001  |
| <b>Tenure at organization</b>   |         |        |                    |       |                    |       |         |
| < 1 year                        | 249     | 100.0% | 106                | 42.6% | 143                | 57.4% | 0.03    |
| 1-4 years                       | 598     | 100.0% | 314                | 52.5% | 284                | 47.5% | 0.01    |
| 5-9 years                       | 231     | 100.0% | 126                | 54.5% | 105                | 45.5% | 0.05    |
| 10+ years                       | 308     | 100.0% | 129                | 41.9% | 179                | 58.1% | 0.007   |
| <b>Acquisition status</b>       |         |        |                    |       |                    |       |         |
| Not acquired                    | 1,015   | 100.0% | 483                | 47.6% | 532                | 52.4% | 0.17    |
| Acquired ≤ 2 years of survey    | 137     | 100.0% | 67                 | 48.9% | 70                 | 51.1% | 0.95    |
| Acquired >2 years of survey     | 234     | 100.0% | 125                | 53.4% | 109                | 46.6% | 0.11    |
| <b>Provider outcomes</b>        |         |        |                    |       |                    |       |         |
| Provider experience* (index ≥4) | 723     | 100.0% | 161                | 22.3% | 562                | 77.7% | <0.001  |
| Burnout † (score = ≤3)          | 415     | 100.0% | 294                | 70.8% | 121                | 29.2% | <0.001  |
| Intent to stay (score ≥4)       | 1,097   | 100.0% | 438                | 39.9% | 659                | 60.1% | <0.001  |

\*Higher = better team experience

† Lower = more burnout



**eAppendix Figure.** Relationship between TEAM score and percent with high Net Promoter Score (NPS).



## Technical eAppendix

The TEAM measure includes 6 items scored using 5-point scales, ranging typically from strongly disagree to strongly agree (higher score = better):

1. The degree to which my care team works efficiently together is... (poor, marginal, satisfactory, good, optimal)
2. I am encouraged by my leadership to collaborate with other providers.
3. My medical group makes it a priority for clinical staff to communicate about patient care (e.g., daily huddles and other activities in the clinic).
4. My team makes continuous improvements in the delivery of patient care.
5. People I work with demonstrate excellence in everything we do.
6. My medical group is effectively managed and well run.

The provider experience measure has been used for many years at Optum, and consists of 6 items scored on 5-point scales, ranging from strongly disagree to strongly agree (higher score = better):

1. I look forward to coming to work.
2. My work gives me a feeling of accomplishment.
3. I can be myself at work.
4. I feel energized in my current role at work.
5. I feel proud to work for our company.
6. I am enthusiastic about my future with our medical group as a place to build my career

The single item burnout measure has been used for over 20 years (10) since the Physician Worklife Survey (11), and has 5 choices; the 3 choices mentioning burnout (1-3) are typically collapsed into a single variable, “burnout” (lower score = more burnout):

1. I feel completely burned out.
2. The symptoms of burnout I am experiencing won't go away. I think about work frustrations a lot.
3. I am definitely burning out and have 1 or more symptoms of burnout (e.g., emotional exhaustion).
4. I am under stress and don't always have as much energy as I did, but I don't feel burned out.
5. I enjoy my work. I have no symptoms of burnout.