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RESEARCH BRIEF

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Pathways for primary care practice adoption of patient engagement strategies

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Abstract

Objective: To identify potential orderings of primary care practice adoption of patient engagement strategies overall and separately for interpersonally and technologically oriented strategies.

Data Sources: We analyzed physician practice survey data ($n = 71$) on the adoption of 12 patient engagement strategies.

Study Design: Mokken scale analysis was used to assess latent traits among the patient engagement strategies.

Data Collection: Three groupings of patient engagement strategies were analyzed: (1) all 12 patient engagement strategies, (2) six interpersonally oriented strategies, and (3) six technologically oriented strategies.

Principal Findings: We did not find scalability among all 12 patient engagement strategies, however, separately analyzing the subgroups of six interpersonally and six technologically oriented strategies demonstrated scalability (Loevinger's H coefficient of scalability [range]: interpersonal strategies, $H = 0.54$ [0.49–0.60], technological strategies, $H = 0.42$ [0.31, 0.54]). Ordered patterns emerged in the adoption of strategies for both interpersonal and technological types.

Conclusions: Common pathways of practice adoption of patient engagement strategies were identified. Implementing interpersonally intensive patient engagement strategies may require different physician practice capabilities than technological strategies. Rather than simultaneously adopting multiple patient engagement strategies, gradual and purposeful practice adoption may improve the impact of these strategies and support sustainability.

KEYWORDS
chronic care management, diffusion of innovations, organizational learning, patient engagement

What is known on this topic

- Patient engagement strategies are inconsistently adopted by primary care physician practices, despite their demonstrated benefits to patient clinical outcomes and experiences.

What this study adds

- Two potentially divergent pathways for practice-level adoption of patient engagement strategies were identified: an interpersonally oriented path and a technologically oriented path.
- Separate organizational capabilities may be needed to support adoption of interpersonally oriented versus technological patient engagement strategies.
- Sequencing practice adoption of patient engagement strategies has the potential to enable integration into organizational routines and support their sustainability.

1 | INTRODUCTION

Patients who are more activated and engaged in their own care have better medication adherence, healthy behaviors, and chronic disease self-monitoring compared to less activated and engaged patients.[1–3] Patient engagement strategies, including motivational interviewing, shared decision making, and shared medical appointments, can improve health outcomes.[4–11] Despite the benefits, patient engagement strategies have been inconsistently adopted by physician practices.[12] The relative ease of adopting patient engagement strategies is important as practice stakeholders grapple with multiple simultaneous innovation adoption decisions and competing priorities for organizational resources.[13]

Currently, no evidence exists about how practices can sequence adoption and implementation of patient engagement efforts incrementally. Although clinicians and staff recognize the importance of patient engagement efforts, they report limited understanding of specific strategies like shared decision making.[14] Physician practices may establish a foundation of relatively easier strategies before implementing more complex changes. Practices may test a strategy with a priority disease area before other clinical foci. Assessing patterns in the landscape of patient engagement strategies can illuminate typical adoption journeys, signaling paths of foundation setting.

Organizational learning theory posits that experiences of implementation success and failure strengthen an organization's ability to adopt innovations that require similar organizational resources and capabilities.[15–18] Pacing of patient engagement strategy adoption can provide the time to integrate each strategy through training, revised performance standards, and efforts to shift norms and expectations.[19] Promoting incremental adoption can avoid overwhelming frontline workers. Previous research found that over one-third of physician practices de-adopted chronic care management processes on net over time,[20] highlighting the major challenge of sustainability.

A key distinction among patient engagement strategies that influence their adoptability is whether they require more technological or interpersonal resources to effectively implement. For example, allowing patients to indicate preferences in their electronic health records does not disrupt clinical workflows but requires adequate technological infrastructure.[21] By contrast, shared medical appointments, where clinicians meet with multiple patients with a common chronic condition simultaneously, require adaptation to practice resources and clinician training and support.[22] Practices expanding strategies might have more success if they build within interpersonal or technological strategy types because implementation requirements may be more similar within types.

Mokken scale analysis is one approach to identify adoption patterns of organizational strategies. It is a nonparametric item response theory technique to determine if there is a latent trait among a group of measures or if the measures are independent of one another.[23–27] It has been applied to test the reliability of questionnaires and to identify sequencing in the adoption of chronic care management processes.[25,27] This analysis can assess ordered difficulties in cross-sectional data. For example, practices that report the adoption of a difficult strategy imply that they also already adopted a less difficult strategy. Comparing the scalability of interpersonal versus technological strategy types can inform whether stronger patterns form overall or within types. In this study, we assessed adoption among strategies overall, as well as within technologically oriented and interpersonally oriented types, to evaluate potential common adoption journeys of practices rolling out complex suites of innovations.

2 | METHODS

2.1 | Study setting and data

We analyzed data from adult primary care practices of two large Accountable Care Organizations (ACOs) participating in the Medicare Shared Savings Program, Advocate Health Care in Chicago, IL, and DaVita HealthCare Partners in Los Angeles, CA (now owned by Optum Health). A total of 71 practice leaders (44 Advocate Health Care and 27 DaVita HealthCare Partners physician practices) were surveyed about their practices' adoption of patient engagement strategies in 2015. The survey collection was approved by the institutional review board of the University of California, Berkeley, and is described elsewhere.[28]

We assessed the adoption of 12 patient engagement strategies, 6 technologically oriented and 6 interpersonally oriented. Technologically oriented strategies included routine health risk assessments, telehealth available for patients with diabetes and/or cardiovascular disease (CVD), shared decision making videos, staff can note patient preferences in the electronic health record, and patients can input patient information in the electronic health record. Interpersonally oriented strategies included motivational interviewing training for clinicians, motivational interviewing training for staff, shared medical appointments for diabetes and/or CVD, patient advisory councils for

diabetes and/or CVD, patients involved in governance and/or quality improvement, and peer–peer programs for diabetes and/or CVD. Respondents indicated the extent to which their clinicians/staff participated in each patient engagement strategy with possible answers as follows: "No," "Yes, but not regularly," "Yes, partially implemented," and "Yes, fully implemented." These items were converted to a dichotomous variable of whether the activity had been regularly implemented (partially or fully implemented) or not (no use or not regular use). We completed a sensitivity analysis where we categorized "Yes, not regularly" as adopted.

2.2 | Analysis

We conducted descriptive analyses on the overall unadjusted prevalence of each patient engagement strategy. We then calculated a tetrachoric correlation matrix and investigated highly correlated items (coefficient: 0.70 or higher).[29] Highly correlated items may suggest that strategies should be grouped together.[30]

Mokken scale analysis evaluated adoption ordering and difficulty among strategies. The literature on Mokken scaling has no consensus on the minimum sample size required for analysis, but published studies have used sample sizes ranging from 133 to 15,022 respondents.[31,32] Given the exploratory nature of this study and novel application to patient engagement research, we utilized our sample of 71 physician practices despite potential sample size limitations.

For forming a monotone homogenous model of Mokken (MHMM), all items must meet three assumptions: (1) unidimensionality, (2) local independence, and (3) monotonicity. Unidimensionality assumes that all items share a common latent trait. Local independence assumes the latent trait is the reason for item responses, not external item or respondent characteristics. Monotonicity assumes that the proportion of positive responses increases with the level of the latent trait.

The Mokken scale analysis of each set of strategies determined a criterion of monotonicity (Criterion ≤40: monotonicity assumed; 40 < Criterion ≤ 80: monotonicity uncertain; Criterion >80: monotonicity not assumed). We conducted a visual inspection of the traces of the items in the scale, which should be steadily increasing to assume monotonicity. We set the minimum size for groups of observations to check for monotonicity to 22, which was our sample size (71) multiplied by 0.30, rounded up to the nearest integer.[33]

The extent to which items measured the same latent trait was signaled by the Loevinger's H coefficient of scalability, measured from 0 to 1, with higher values signaling a stronger scale (H < 0.30: no scaling; 0.30 ≤ H < 0.40: weak scaling; 0.40 ≤ H < 0.50: medium scaling; H ≥ 0.50: strong scaling).[33] We compared the strength of scaling among strategies overall, as well as specific interpersonal and technological types.

If the patient engagement strategy responses demonstrated scalability (H ≥ 0.30) and satisfied the MHMM requirements (criterion ≤80), then we tested if they also showed consistent ordering, referred to as a doubly monotone homogeneous model of Mokken (DMHMM). To determine whether the model satisfied as a DMHMM, we assessed calculated criteria with the same reference points as utilized in the monotonicity check (criterion ≤80). In a DMHMM, strategies with higher adoptability would be lower in the series and a lower adoptability would be higher in the series. For example, a finding that routine health risk assessments were lower in the series than other strategies would signal that health risk assessments may be adopted as a foundation for other strategy use. Mokken scale analysis was accomplished in STATA 16.0 through the *msp* and *loevh* commands.[34]

3 | RESULTS

The mean total number of patient engagement strategies adopted was 5.35 of 12 assessed (Table 1). Three physician practices (4.2%)

TABLE 1 Adoption of technologically oriented and interpersonally oriented patient engagement strategies by physician practices

	Adoption by physician practices ($N = 71$)
	Number (%)
Overall patient engagement strategies (average)	44.6%
Technological patient engagement strategies (average)	50.3%
Health risk assessment results available to care team	51 (71.8%)
Staff can note patient preferences in electronic health record	50 (70.4%)
Routine health risk assessments	45 (63.4%)
Patients can input patient information in the electronic health record	43 (60.6%)
Telehealth for patients with diabetes and/or cardiovascular disease	18 (25.4%)
Shared decision making videos	7 (9.9%)
Interpersonal patient engagement strategies (average)	39.0%
Clinicians trained in motivational interviewing	44 (62.0%)
Shared medical appointments for patients with diabetes and/or cardiovascular disease	35 (49.3%)
Staff trained in motivational interviewing	29 (40.8%)
Peer–peer programs for patients with diabetes and/or cardiovascular disease	24 (33.8%)
Patients in practice governance, including quality improvement teams	18 (25.4%)
Patient advisory councils for diabetes and/or cardiovascular disease	16 (22.5%)

Source: Practice leaders of 71 adult primary care practices affiliated with two Accountable Care Organizations. Respondents indicated the extent to which their clinicians/staff participated in each patient engagement strategy with possible answers as follows: "No," "Yes, but not regularly," "Yes, partially implemented," and "Yes, fully implemented." These items were converted to a dichotomous variable of whether the activity had been regularly implemented (partially or fully implemented) or not (no use or not regular use).

adopted all 12 possible strategies, and five physician practices (7.0%) adopted none (Figure S1). On average, technological strategies (average: 50.3%) were adopted at a higher rate than interpersonal strategies (average: 39.0%).

The average correlation between patient engagement strategies was low overall (correlation coefficient, $\rho = 0.32$) and slightly higher between interpersonal strategies ($\rho = 0.30$) than between technological strategies ($\rho = 0.26$) (Table S1). Shared medical appointments for diabetes and/or CVD and shared decision making videos were perfectly correlated ($\rho = 1.00$). Of the seven physician practices that adopted shared decision making videos, all had adopted shared medical appointments. Given these are distinct strategies, we did not group them into a composite item.

The 12 patient engagement strategies overall had medium scalability (overall Loevinger's H coefficient = 0.46, range: 0.35 to 0.55) (Table 2). However, the scale did not meet the monotonicity assumption, as the criterion for shared decision making videos was above the threshold value of 80 (criterion value = 103), confirmed by a visual inspection of the trace line.

The six interpersonal strategies had strong scalability (H = 0.54, range: 0.49 to 0.60), satisfied all assumptions of an MHMM (criteria range: −15 to −10) and all assumptions of a DMHMM (criteria range: −15 to 7). Strategies were ordered from most to least adoptable: clinicians trained in motivational interviewing, shared medical appointments for patients with diabetes and/or CVD, staff trained in motivational interviewing, patient advisory councils for patients with diabetes and/or CVD, patients in governance and/or quality improvement, and peer–peer programs for patients with diabetes and/or CVD (Figure 1).

The six technological strategies had medium scalability (H = 0.42, range: 0.31 to 0.54), satisfied all assumptions of an MHMM (range:

TABLE 2 Strength of scaling among Mokken scales of patient engagement strategies

	Overall strategies	Interpersonal strategies	Technological strategies
Overall Loevinger's H coefficient of scalability: mean H (individual H range)	0.47 (0.35, 0.55)	0.54 (0.49–0.60)	0.42 (0.31, 0.54)
Criteria for monotone homogeneous model of Mokken: mean (range)	1 (−13, 103)	−11.8 (−15, −10)	−5.8 (−12, 0)
Criteria for doubly monotone homogeneous model of Mokken: mean (range)	None	−6.2 (−15, 7)	10.8 (−11, 27)
Overall scalability	None	Strong	Medium
Ordering	None	Yes	Yes

Note: Results of Mokken scale analysis of patient engagement strategies overall and among types (interpersonally vs. technologically oriented strategies). Results are interpreted with the following parameters: monotonicity (Criterion ≤40: monotonicity assumed; 40 < Criterion ≤80: monotonicity uncertain; Criterion >80: monotonicity not assumed); Loevinger's H coefficient of scalability (H < 0.30: no scaling; 0.30 ≤ H < 0.40: weak scaling; 0.40 ≤ H < 0.50: medium scaling; H ≥ 0.50: strong scaling).

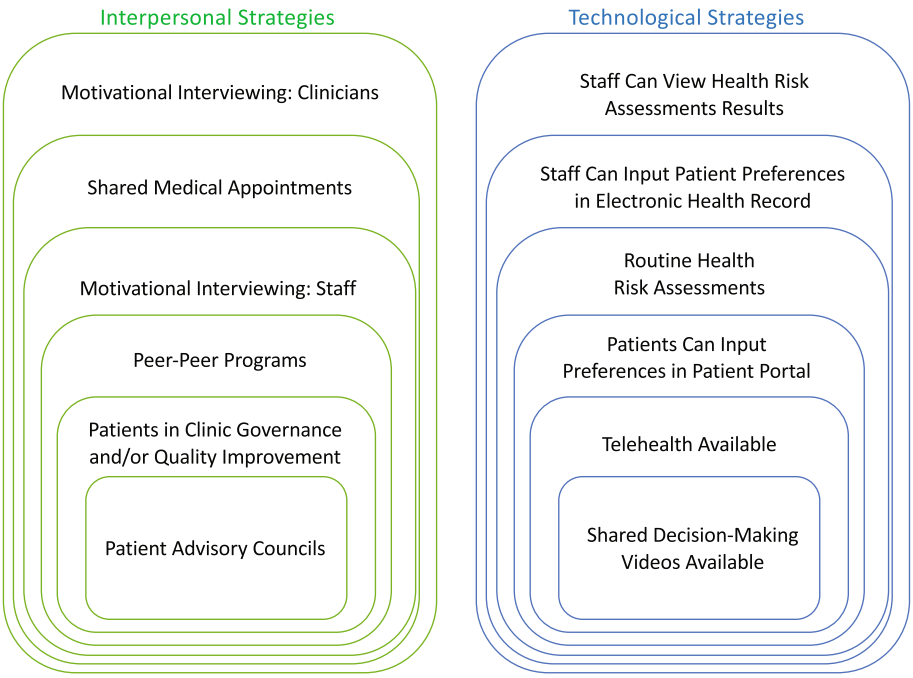

FIGURE 1 Adoptability order among patient engagement strategies in interpersonal and technological types. This figure displays ordering of patient engagement strategies within two types: interpersonal strategies displayed in green and technological strategies in blue. Larger boxes are the most adoptable strategies, and inner boxes are the least adoptable strategies. Physician practices would have already adopted outer boxes before adopting nested boxes [Color figure can be viewed at wileyonlinelibrary.com]

−12 to 0) and all assumptions of a DMHMM (range: −11 to 27). Strategies were ordered from most to least adoptable: staff can view health risk assessments, staff can input patient preferences in the electronic health record, health risk assessments are conducted routinely over time, telehealth is available for patients with diabetes and/or CVD, and shared decision making videos are used. In a sensitivity analysis, we defined practice adoption as having implemented the strategy even if not regularly used, resulting in all three sets of strategies demonstrating weak scaling (overall, interpersonally oriented, and technologically oriented) (Table S3).

4 | DISCUSSION

There is a gap in the evidence to guide adult primary care practices in how to establish and expand patient engagement strategies. We assessed scalability in the adoption of patient engagement strategies, suggesting common latent traits and potential pathways to grow a portfolio of strategies. We found that, while all 12 patient engagement strategies did not demonstrate scalability, approaching interpersonally or technologically oriented strategies separately demonstrated scalability. We expected to detect scaling among all strategies as they are grounded in a shared objective to increase patient engagement in their care, similar to a previous study that observed medium scalability among care management processes.[27] These results suggest that compared to patient engagement strategies, care management processes may share a stronger common latent trait as they have a relatively long history and a more consistent set of activities.

When categorizing patient engagement strategies by type, we observed medium scalability among technologically oriented strategies and strong scalability among interpersonally oriented strategies. This suggests that physician practices may be influenced by whether the strategies require technological versus interpersonal capabilities when making adoption decisions. This may reflect distinct strategic priorities or foundational organizational capabilities of physician practices adopting within strategy types that are not observed when the strategies are examined overall.

For illustration, the adoption of shared decision making videos violated the assumptions to scale overall but was found to scale well when grouped with similar technologically oriented strategies. Only seven physician practices had adopted shared decision making videos, making it the least adopted strategy in our sample. Physician practices that had successfully adopted numerous technological strategies may be prepared to adopt difficult and innovative shared decision making videos as well. This pattern of ordered difficulty or preparation is not reflected when considering a mix of interpersonal and technological strategies.

Shared latent traits detected within scales of the same type may reflect paths of organizational learning. For example, physician practices that learned to adapt quickly to operational changes in the adoption of shared medical appointments[22] could be prepared to overcome the interpersonally complex challenge of creating patient advisory councils.[35] The process of integrating interpersonal or technological patient engagement strategies may build absorptive capacity for the physician practice to adopt more difficult strategies within the same type.[15–18] In other words, the skills and processes that are accumulated in the adoption of interpersonal strategies, such as changes in organizational culture and professional norms, may be more directly relevant to another interpersonal strategy rather than a technological strategy.

For encouraging the expansion of patient engagement strategies by late adopters, policy and capacity-building programs can encourage the paths most traveled. Within both interpersonal and technological types, the sequence of adoption followed the same ordering as the most to least prevalent strategies. While not prescriptive or normative, this suggests common existing pathways to building patient engagement strategies into organizational routines, with the most frequently adopted strategies usually being adopted before the next most frequently adopted strategy.

For example, allowing practice staff to view health risk assessment results in the electronic health record may enable future implementation of technological patient engagement strategies. As clinicians and staff acclimate to reading and using new sources of patient information, they can then indicate patients' preferences in the electronic health record, the next strategy we found in the technological adoption order. Similarly, physician practices may find it easier to train clinicians in motivational interviewing before training staff.

In this study, we used Mokken scale analysis, a method with broad potential applications for understanding the implementation of new processes in health services research. Our finding that adoption may occur along two divergent paths, one interpersonally and one technologically oriented, has implications for how primary care practices grow a portfolio of evidence-based practices. Primary care practices can reflect on successful learning mechanisms and apply best practices in the adoption of subsequent similar innovations. The results of sensitivity analyses indicated that more extensive implementation of each strategy might be required to support expansion. Future studies should assess pathways alongside social risk interventions, given that these strategies may be synergistic.

Our study should be considered in light of certain limitations. First, results were from 71 adult primary care practices and may not apply to practices not participating in ACOs. Second, we were unable to assess the characteristics of the adopting physician practices. Future studies should consider potential heterogeneity in implementation difficulty based on local organizational capabilities (health information technology infrastructure) and sociodemographic profiles of patients attributed to the individual practices. Third, practice adoption measures were simplified as "adopted" versus "not adopted." However, we conducted sensitivity analyses by classifying "Yes, but not regularly" as both adopted and not and presenting the results in Appendix S1. Last, although Mokken scale analyses can assess difficulty and scalability, we did not observe the temporal ordering of practice adoption. Longitudinal research may display how practices adopt and de-adopt patient engagement strategies over time and clarify when simultaneous adoption is possible.

5 | CONCLUSIONS

Adoption of patient engagement strategies appears to occur along two paths: one interpersonally and the other technologically oriented. We detected a predictable pattern of practice adoption within these two types of strategies, which may reflect that adopting and implementing strategies require similar resources within each type. Rather than simultaneously adopting multiple patient engagement strategies, gradual and purposeful practice adoption may improve the impact of these strategies and support sustainability.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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