Online supplement for 10.1176/appi.ps.202100626
Table A1. Summary of Exploratory Factor Analysis Results.
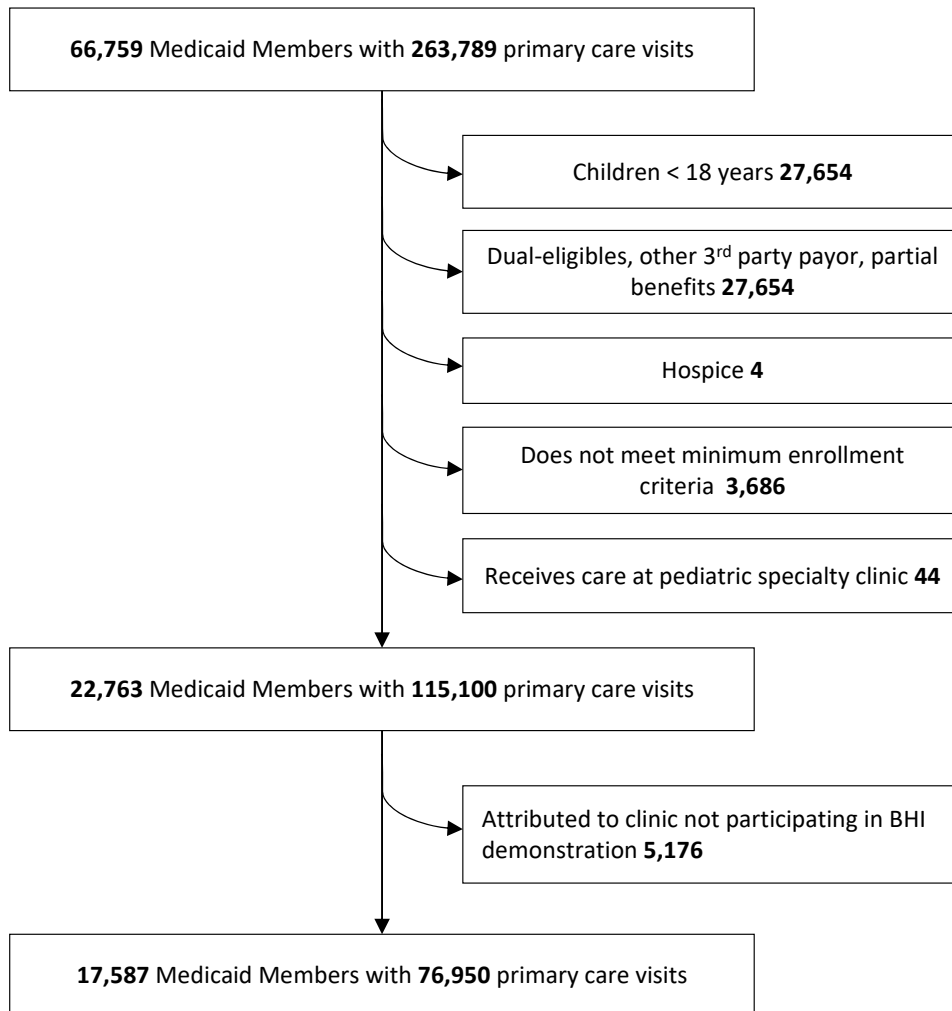
	Original MeHAF Domains		Redistributed Domains from Factor Analysis	
	Domain 1	**Domain 2**	**Factor1**	**Factor2**
	Integrated services and Patient/Family Centeredness	*Practice/ Organization*	Infrastructure for Team-Based Care	Activities related to patient and family engagement
Q1: Overall level of colocation integration	X		X	
Q2: Shared treatment plan	X		X	
Q3: Data systems/patient records		X	X	
Q4: Patient care team for implementing integrated care		X	X	
Q5: Providers' engagement with integrated care ("buy-in")		X	X	
Q6: Continuity of care between primary care and behavioral/mental health		X	X	
Q7: Physician, team & staff education & training for integrated care		X	X	
Q8: Funding sources/resources		X	X	
Q9: Screening and assessment for emotional/behavioral health needs/ Q10: Screening and assessment for medical care needs	X		X	
Q11: Patient care based on/informed by best practice evidence	X		X	
Q12: Coordination of referrals and specialists		X	X	
Q13: Organization leadership for integrated care		X		
Q14: Patient/family input to integration management		X	X	X
Q15: Patient/family involvement in care plan	X			X
Q16: Communication with patients about integrated care	X			X
Q17: Follow-up of assessments, tests, treatment, referrals and other services	X			X
Q18: Social support (for patients to implement recommended treatment)	X			X
Q19: Linking to community resources	X			X

Notes: *MeHAf instrument can be found on the HCA website at https://www.hca.wa.gov/assets/P4R-physical-behavioral-health-integration-practice-site.pdf*

Exploratory Factor Analysis Methodology

  In preliminary analyses we conducted an exploratory factor analysis (EFA) using MeHAF survey data from 100 primary care clinics across 3 counties in Washington state. Primary care practice sites included both Federally Qualified Health Centers and hospital-affiliated primary care clinics. A promax oblique factor rotation raised to the third power was used to account for correlation between the factors. We retained factors with eigenvalues of 1 or more, and items with factor loadings 0.6 or higher. The factor loading cut-off was adjusted to account for differences in sample size, number of factors, and number of items. We then excluded items with Kaiser-Meyer-Olkin values lower than 0.80 and communalities of less than 0.4. We did not have Medicaid claims data for beneficiaries outside of King County, WA. So, although we utilize the same domains and items from our EFA, we could only include data from clinics in King County for our analysis examining the association between integrated care and hospital use.

Figure A1. Cohort Derivation

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┌─────────────────────────────────────────────────────────┐
│ 66,759 Medicaid Members with 263,789 primary care visits │
└─────────────────────────────────────────────────────────┘
        │
        │──────→  ┌──────────────────────────────────────────┐
        │         │ Children < 18 years 27,654               │
        │         └──────────────────────────────────────────┘
        │
        │──────→  ┌──────────────────────────────────────────┐
        │         │ Dual-eligibles, other 3rd party payor,   │
        │         │ partial benefits 27,654                  │
        │         └──────────────────────────────────────────┘
        │
        │──────→  ┌──────────────────────────────────────────┐
        │         │ Hospice 4                                │
        │         └──────────────────────────────────────────┘
        │
        │──────→  ┌──────────────────────────────────────────┐
        │         │ Does not meet minimum enrollment         │
        │         │ criteria 3,686                           │
        │         └──────────────────────────────────────────┘
        │
        │──────→  ┌──────────────────────────────────────────┐
        │         │ Receives care at pediatric specialty     │
        │         │ clinic 44                                │
        │         └──────────────────────────────────────────┘
        ↓
┌─────────────────────────────────────────────────────────┐
│ 22,763 Medicaid Members with 115,100 primary care visits │
└─────────────────────────────────────────────────────────┘
        │
        │──────→  ┌──────────────────────────────────────────┐
        │         │ Attributed to clinic not participating   │
        │         │ in BHI demonstration 5,176               │
        │         └──────────────────────────────────────────┘
        ↓
┌─────────────────────────────────────────────────────────┐
│ 17,587 Medicaid Members with 76,950 primary care visits  │
└─────────────────────────────────────────────────────────┘
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Notes: Adult (18-64 years) Medicaid enrollees who could be attributed to community health centers participating in the integrated care demonstration were included in the study. We excluded children < 18 years of age; enrollees who were not enrolled for at least 5 of 6 months of the outcomes assessment period and at least 7 of the 12-month risk-adjustment period; enrollees with third party coverage and dual-eligibles; enrollees receiving hospice care; and enrollees attributed to one pediatric specialty clinic. This study was approved by the Washington state Institutional Review Board.

Figure A2. Study Design showing relationship between time periods used for capturing integrated care services, attributing of enrollees to clinics, risk-adjustment and outcomes assessment.

	2018-Q1	2018-Q2	2018-Q3	2018-Q4	2019-Q1	2019-Q2
Survey (exposure)					MeHAF performance period	
Attribution			Counts primary care visits for provider attribution			
Risk-adjustment	Measurement of comorbidities and prior acute care utilization					
Outcomes					ED visits	

Notes: Clinics were asked to report on several elements of integrated care that were present for a performance period of January – June 2019. Outcomes were assessed cross-sectionally as the proportion of attributed beneficiaries that had either an ED visit or inpatient admission during the same period. Twelve months of claims data were used to capture comorbidities and baseline health care use for risk-adjustment in the year prior to the performance period. Finally, patients were attributed to clinics where they received a plurality of primary care during the 6-month performance period plus an additional 6-month look-back.

Table A2. Characteristics of study clinics

	Integrated Team Infrastructure					Patient & Family Engagement				
	Low	Average	*p-val*	High	*p-val*	Low	Average	*p-val*	High	*p-val*
Clinics, N	7	8		7		8	7		7	
Total Attributed Patients, N	2997	10347		4243		9244	3263		5080	
Annual Office Visits, N,	20414 (6174)	27929 (9990)	0.11	22105 (9350)	0.72	25576 (7755)	20569 (5125)	0.30	24639 (12953)	0.85
Office visits/patient	3.5	3.6		3.7		3.6	3.2		4.0	
Patients served/clinic	831	982		847		882	924		880	
Provider Staffing, FTE										
Primary Care	6.3 (3.4)	5.8 (2.1)	0.70	5.1 (2.4)	0.43	5.0 (2.4)	7.0 (1.3)	0.14	5.3 (2.1)	0.83
Behavioral Health	1.7 (1.1)	2.0 (1.1)	0.70	2.4 (1.9)	0.35	2.4 (.5)	3.0 (.8)	0.06	2.1 (2.1)	0.48
Payor Mix, %,										
Medicaid	48.7 (10.3)	53.6 (6.6)	0.37	62.0 (13.7)	0.03	54.5 (5.8)	54.0 (10.8)	0.94	55.7 (17.1)	0.85
Medicare	11.3 (9.3)	11.9 (7.3)	0.88	9.4 (4.5)	0.64	12.8 (5.8)	9.4 (5.9)	0.39	10.3 (9.5)	0.52
Commercial	25.9 (20.4)	20.0 (5.9)	0.38	15.6 (6.4)	0.14	18.9 (6.5)	19.9 (6.2)	0.89	22.9 (21.5)	0.57
Self-Pay	13.6 (9.4)	14.3 (7.6)	0.89	13.0 (11.8)	0.91	13.8 (3.1)	16.0 (10.3)	0.65	11.1 (12.9)	0.60
Other	0.4 (0.8)	0.1 (0.4)	0.29	0.1 (0.4)	0.33	0.1 (0.4)	0.6 (0.8)	0.10	0.0 (0)	0.63
MeHAF score, mean (SD)										
Overall	81 (11)	95 (9)	0.01	120 (9)	<0.01	85 (10)	98 (13)	0.90	114 (20)	<0.01
Integrated Team Structure	29 (7)	38 (1)	<0.01	47 (4)	<0.01	35 (6)	37 (7)	0.71	42 (12)	0.11
Patient & Family Engagement	18 (5)	18 (5)	0.74	26 (3)	<0.01	14 (0)	22 (3)	<0.01	27 (3)	<0.01

Table A3. Characteristics of attributed Medicaid enrollees

	Integrated Team Infrastructure					Patient & Family Engagement				
	Low	Average	p-val	High	p-val	Low	Average	p-val	High	p-val
	N=2997	N=10347		N=4243		N=9244	N=3263		N=5080	
Age, years, mean (SD)	42.5 (13.1)	40.7 (13.9)	<0.01	40.9 (14.4)	<0.01	40.5(13.5)	40.5 (13.9)	0.98	42.3 (14.6)	0.000
Female, %	51.9%	58.3%	<0.01	58.2%	<0.01	55.9%	61.8%	<0.01	56.6%	0.39
Race/Ethnicity, %										
Native American	13.5%	0.5%	<0.01	0.4%	<0.01	4.7%	0.6%	<0.01	0.4%	<0.01
Asian	4.6%	23.1%	<0.01	25.9%	<0.01	10.1%	12.9%	<0.01	44.7%	<0.01
Black	22.9%	31.2%	<0.01	17.8%	<0.01	32.2%	32.5%	0.61	12.4%	<0.01
Hispanic/Latinx	12.3%	9.8%	<0.01	14.0%	0.01	11.4%	14.3%	<0.01	8.9%	<0.01
Hawaiian/Pacific Islander	1.7%	2.5%	0.02	3.6%	<0.01	2.4%	2.9%	0.17	2.9%	0.09
White	32.3%	24.0%	<0.01	26.7%	<0.01	29.0%	26.5%	<0.01	20.3%	<0.01
Multiple	8.8%	5.0%	<0.01	5.5%	<0.01	6.4%	5.8%	0.29	4.7%	<0.01
Unknown	3.9%	3.9%	0.95	5.9%	<0.01	3.7%	4.5%	0.05	5.6%	<0.01
All POC	16.4%	60.3%	<0.01	23.3%	<0.01	47.0%	17.0%	<0.01	28.5%	<0.01
Gagne Score	0.7 (1.3)	0.4 (1.1)	<0.01	0.4 (1.1)	<0.01	0.5 (1.2)	0.4 (1.1)	<0.01	0.4 (1.1)	<0.01
Comorbidities, N	2.4 (2.6)	1.7 (2.2)	<0.01	1.8 (2.4)	<0.01	1.9 (2.4)	1.9 (2.4)	0.89	1.6 (2.2)	<0.01
Mental Health Condition, %	59.6%	41.2%	<0.01	40.4%	<0.01	48.6%	45.2%	<0.01	35.0%	<0.01
Substance Use Condition, %	40.1%	17.2%	<0.01	15.5%	<0.01	25.2%	17.1%	<0.01	14.8%	<0.01
Healthcare Utilization, N										
Outpatient	7.8 (9.5)	6.3 (6.2)	<0.01	6.3 (6.3)	<0.01	6.8 (7.3)	6.4 (6.6)	<0.01	6.4 (6.3)	0.01
ED	1.8 (6.6)	.9 (4.7)	<0.01	.8 (2.9)	<0.01	1.2 (5.1)	1.1 (4.3)	0.18	.67 (4.3)	<0.01
Inpatient	.10 (.46)	.07 (.36)	<0.01	.06(.32)	<0.01	.08 (.40)	.08 (.37)	0.62	.05 (.31)	<0.01

Notes: POC = persons of color

Table A4. Average marginal effects of the domains of behavioral health integration on ED use and inpatient admissions across all attributed patients

	Low	Average	High	Difference Low versus Average	Difference Low Versus High
Infrastructure for team-based care					
ED Use	40.4% (29.6, 51.3)	31.2% (27.6, 34.8)	33.2% (27.6-38.8)	-9.2 (-21.0, 2.6)	-7.2% (-19.2, 4.8)
Inpatient Admission	3.2% (2.5, 3.9)	3.4% (2.7, 4.1)	3.2% (2.4, 3.9)	0.02 (-0.07, 1.1)	<0.01 (-1.1, 1.0)
Patient & Family Engagement Activities					
ED Use	34.3% (29.0, 39.6)	35.4% (29.2, 41.6)	30.6% (25.2, 36.0)	1.1% (-7.0, 9.2)	-3.7% (-11.4 to 4.0)
Inpatient Admission	3.5% (3.0, 4.1)	3.0% (2.5, 3.5)	2.9% (2.1, 3.8)	-0.5% (-1.3, 0.2)	-0.6% (-1.6, 0.4)

Table A5. Average marginal effects of the domains of behavioral health integration on ED use for subset of patients with a behavioral health condition

	Low	Average	High	Difference Low versus Average	Difference Low Versus High
Infrastructure for team-based care	60.5% (41.0, 79.9)	46.2% (37.7, 54.7)	49.3% (36.8, 61.8)	-14.3% (-37.1, 8.5)	-11.2% (-34.8. 12.4)
Patient & Family Engagement Activities	50.1% (39.8, 60.5)	52.2% (40.5, 63.9)	44.9 (32.6, 57.2)	2.1 (-13.9, 18.0)	-5.3 (-21.9, 11.4)

Note: due to small sample sizes, the hierarchical models for inpatient admissions did not converge in the subgroup analysis. Average marginal effects for team based care were significant until we applied a small cluster correction to our standard errors. Thus, our results are conservative.