Development and Testing of the Multidimensional Trust in Health Care Systems Scale

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OBJECTIVE: To describe the development and psychometric testing of the Multidimensional Trust in Health Care Systems Scale (MTHCSS).

METHODS: Scale development occurred in 2 phases. In phase 1, a pilot instrument with 70 items was generated from the review of the trust literature, focus groups, and expert opinion. The 70 items were pilot tested in a sample of 256 students. Exploratory factor analysis was used to derive an orthogonal set of correlated factors. In phase 2, the final scale was administered to 301 primary care patients to assess reliability and validity. Phase 2 participants also completed validated measures of patient-centered care, health locus of control, medication nonadherence, social support, and patient satisfaction.

RESULTS: In phase 1, a 17-item scale (MTHCSS) was developed with 10 items measuring trust in health care providers, 4 items measuring trust in health care payers, and 3 items measuring trust in health care institutions. In phase 2, the 17-item MTHCSS had a mean score of 63.0 (SD 8.8); the provider subscale had a mean of 40.0 (SD 6.2); the payers subscale had a mean of 12.8 (SD 3.0); and the institutions subscale had a mean of 10.3 (SD 2.1). Cronbach's α for the MTHCSS was 0.89 and 0.92, 0.74, and 0.64 for the 3 subscales. The MTHCSS was significantly correlated with patient-centered care ($r=.22$ to $.62$), locus of control—chance ($r=.42$), medication nonadherence ($r=-.22$), social support ($r=.25$), and patient satisfaction ($r=.67$).

CONCLUSIONS: The MTHCSS is a valid and reliable instrument for measuring the 3 objects of trust in health care and is correlated with patient-level health outcomes.

KEY WORDS: Multidimensional Trust in Health Care Systems Scale; interpersonal trust; health care; psychometrics; trust; health services research.

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BACKGROUND

Trust is operationally defined as the optimistic acceptance of a vulnerable situation in which the trustee believes the trustor will take care of the trustee's interests¹. There are 2 distinct aspects of trust. Interpersonal trust is the type of trust that develops when there is opportunity to repeatedly test how dependable an individual is over time. In contrast, social trust refers to trust in a collective institution and is typically influenced by past experiences, the media, and general social confidence in the particular institution².

Trust in health care providers, health care institutions, and health care payers appears to be influenced in varying degrees by interpersonal trust and social trust. Trust also has both behavioral and attitudinal components. An example of the attitudinal component of trust is the willingness of a patient to forgive medical errors if there is the perception that the provider, institution, or payer was caring and meant well. Similarly, patients may have high levels of trust in a provider, an institution, or a health payer even though the care provided is objectively inferior¹. Distrust conversely is not necessarily the absence of trust. Distrust may be defined as having anxious or pessimistic views of motivation and expected results³ or a substitute or complement to trust such that an initially distrustful patient may become very trusting if initial experiences are positive^{4–5}.

The object of trust in the health care setting is who or what the patient trusts and what about them is trusted¹. There are 3 main objects of trust in the health care setting: (1) health care providers (physicians, nurse practitioners, physician assistants), (2) health care institutions (hospitals and clinics), and (3) health care payers (managed care plans, private insurers, government insurance). Trust may differ depending on the object of trust and the level of trust of 1 object may be influenced by levels of trust of other objects. For instance, the trust a patient has in a particular health care provider may influence the level of trust the patient has on the health care provider's institution. Similarly, patients may be trusting of a particular provider but distrustful of the health care payer.

Numerous studies have shown that there are multiple dimensions of trust^{1,6–10}. Most studies suggest that at least 4 dimensions are important. These include agency/fidelity, competence, honesty, and confidentiality¹. Agency/fidelity is the pursuit of a patient's best interest and consists of caring, respect, advocacy, and avoiding conflicts of interest. Competence is the avoidance of cognitive or technical mistakes while producing the best results. Honesty demands telling the truth and avoiding intentional falsehoods such as outright lies, half-

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truths, or deception by silence. Finally, confidentiality involves protection and proper use of sensitive information. It appears that these dimensions, although conceptually different, are so correlated that they perform as a single construct¹.

Although many scales are available to measure trust in specific components of the health care system,^{6–19} few currently available scales are designed to measure trust in health care providers, trust in health care institutions, and trust in health payers concurrently. Therefore, the goals of this study were threefold: (1) to develop a Multidimensional Trust in Health Care Systems Scale (MTHCSS) that captures the 3 major objects of trust including trust in health care providers, trust in health care institutions, and trust in health payers; (2) to examine the scale's psychometric properties; and (3) to assess correlations between the multidimensional scale of trust and patient-level health outcomes, including patient-centered care, locus of control, medication nonadherence, social support, and patient satisfaction.

METHODS

The study was conducted in 2 phases—phase 1 (scale development) and phase 2 (evaluation of the final instrument).

Phase 1: Scale Development

Conceptual Model. We developed a conceptual model after a review of the literature related to objects of trust/distrust in the health care system. In our conceptual model, we defined trust in health care systems as comprised of trust in health care providers, health care insurers, and health care institutions. Patient characteristics included in the model were age, gender, marital status, educational level, insurance status, income, and having a usual source of care. Consistent with the findings of prior studies, we also identified race/ethnicity as an important variable that influences the level of trust patients have in health care systems^{13,20–27}.

Focus Groups. A convenience sample of 48 subjects participated in 9 focus groups segmented by race and gender. Participants were adults recruited from a primary care clinic of an academic medical center. Participants received a \$25 honorarium for sessions that lasted approximately 2 hours. The mean age of the participants was 46 years. About 81% were African American, and 42% were women. Two experienced qualitative researchers were compensated to serve as focus group moderators. One moderator was white, whereas the other was African American. Moderators were matched to the race/ethnicity of the participants. The primary author (Egede) attended most of the sessions. Each moderator used a written discussion guide.

Open-ended questions were used to initiate conversation before specific probes were introduced. The moderators' transcripts were reviewed after each session and used to modify the conduct of subsequent sessions. Sessions were conducted until "theoretical saturation" was reached. Full and accurate transcriptions of audiotapes, moderator, and research assistant's notes were made. The transcripts were read by the moderators and the primary author (Egede) to identify themes related to trust or distrust of the medical

care system. The primary author (Egede) made the final decision about primary themes and items to include in the pilot scale.

Item Generation and Selection. Following the focus groups, items were generated and selected for pilot testing. We developed a pilot trust scale that included items from previously published trust scales^{6–19} and items created and added based on information collected during the focus groups. Some items selected from previously published scales were modified from their original form to make them pertinent to the 3 major objects of trust (providers, payers, and institutions). The initial items were reviewed by 2 experts familiar with the current literature on trust to determine the relevance of the items for measuring the construct of trust. After expert review, 70 items consisting of statements related to trust in health care providers, health care payers, and health care institutions were selected for pilot testing. Items were scored on a 5-point Likert scale with scores ranging from 5 (strongly agree) to 1 (strongly disagree). A summary score consisting of the sum of individual items was created, so that higher total and subscale scores represented greater trust in health care systems.

Pilot Scale Testing. The 70-item pilot trust scale was administered to a convenience sample of students at a university in the southeastern United States via a web-based survey (pilot sample). All enrolled undergraduate students were e-mailed an invitation to participate in the study. The e-mail contained a link to the web-based survey. Approximately 2,000 students were contacted. Approximately 1,000 e-mails were returned as invalid addresses, thus ~1,000 students received the initial e-mail. These students with valid e-mail addresses were solicited via 2 additional e-mails sent at 1-week intervals. Of this number, 257 completed the web-based survey, resulting in a response rate of approximately 26%. All responses were collated and stored in Statistical Package for the Social Sciences (SPSS 14.0)²⁸.

Data reduction techniques were employed to construct a parsimonious multidimensional trust scale, which combines the strengths of other trust scales and incorporates the 3 objects of trust. An exploratory factor analysis (principal component analysis with Varimax Rotation) was used to derive a set of correlated factors that explained the maximum amount of variation among all the scale items. We used the Kaiser–Guttman criterion (eigenvalues greater than 1.0) to decide the number of factors and associated items that would be retained²⁹. Item–item and item–total scale correlations analysis were completed to ensure that internal consistency and reliability existed in the scale. Item selectivity correlations were calculated for each item on the pilot scale as a measure of item–item correlation. We checked individual item loadings with all identified factors. Items were retained if they only loaded on 1 factor with a factor loading of at least 0.40. In addition, items were selected if they correlated at greater than or equal to .5 with at least 1 factor and did not correlate at greater than .3 with the other factors²⁹. Cronbach's alphas were calculated for each subscale and the total scale as a measure of internal consistency and reliability (item–scale correlation) or the extent to which the items measure the same aspects of the same characteristic.

Table 1. Pilot Sample Characteristics

Characteristics	Percent
Pilot sample (n=257)	
Age	
<25 years	38.7
25–29 years	32.8
30–39 years	19.1
40+ years	9.4
Sex: women	75.0
Race/ethnicity	
White	81.2
African American	9.0
Hispanic/other	9.8
Marital status	
Single	59.2
Married	34.5
Separated/divorced	6.3
Educational level	
Freshman	19.1
Sophomore	24.6
Junior	20.1
Senior	36.2
Insurance status	
Individual plan	35.5
Group plan	61.3
Uninsured	3.1
Income	
<\$5,000	20.1
\$5,000–\$19,999	17.7
\$20,000–\$34,999	26.1
\$35,000+	36.1
Usual source of care: Yes	63.8
Saw health provider past 12 months: Yes	89.1
Used Emergency room past 12 months: Yes	11.1

Phase 2: Evaluation of Final Instrument

In phase 2, we administered the revised final scale to a convenience sample of 301 consecutive patients (final sample) attending a primary care clinic at an academic medical center in the southeastern United States. Patients were recruited over a 10-week period. The final scale was based on the constructs (factors) and items that emerged from phase 1. The same Likert scale scoring was used in the final scale as in the pilot scale. A confirmatory factor analysis (principal component analysis with Varimax Rotation) was performed to derive a set of correlated factors that explain the maximum amount of variation among all the scale items. We used the same procedures for factor retention and item analysis to examine internal consistency and reliability. Item–item and item–total scale correlations analysis were again completed to ensure that internal consistency existed in the scale. Mean trust scale summary scores and mean subscale scores were compared by sample demographic characteristics (age, sex, race/ethnicity, marital status, educational level, insurance status, and income).

Validated measures of patient-centered care, locus of control, medication nonadherence, social support, and patient satisfaction were completed to examine criterion related validity of the scale. Patient-centered care was measured with the Modified Picker Survey,^{30–32} health locus of control was measured with the Multidimensional Health Locus of Control Scale,³³ medication nonadherence was measured with the Morisky Scale,³⁴ social support was measured with the Medical Outcomes Study (MOS) Social Support Survey,³⁵ and patient satisfaction was measured with a previously validated general scale to measure satisfaction/dissatisfaction with

Table 2. Final Sample Characteristics

Characteristics	Percent
Final sample (n=301)	
Age	
<35 years	10.9
35–49 years	29.0
50–64 years	39.6
65+ years	20.5
Sex: women	64.5
Race/ethnicity	
White	48.7
African American	48.3
Hispanic/other	3.0
Marital status	
Single	16.8
Married	54.4
Separated/divorced	18.5
Widowed	10.4
Educational level	
<High school graduate	15.4
High school graduate	29.0
<College graduate	22.5
≥College graduate	33.1
Insurance status	
Private insurance	60.3
Government insurance	33.2
Uninsured	6.4
Income	
<\$10,000	23.3
<\$25,000	12.5
<\$35,000	10.8
<\$50,000	13.3
<\$75,000	20.4
<\$100,000	11.5
\$100,000+	8.2
Usual source of care: Yes	86.9
Saw health provider past 12 months: Yes	94.6
Used Emergency room past 12 months: Yes	11.1
Number of health provider visits in past 12 months	
0/1	7.4
2	17.9
3	13.6
4	17.5
5+	43.6
Number of emergency department visits in past 12 months	
0	7.9
1	55.6
2	11.9
3	9.5
4+	15.1

health care. We selected these variables because each has been associated with trust¹⁴. We hypothesized that these variables would be associated with levels of trust.

The studies were reviewed and approved by our Institutional Review Board for Human Research.

RESULTS

Phase 1: Scale Development

A convenience sample of 257 students responded to the online survey. The response rate was 26% of the students invited to participate. The demographic characteristics of the sample are reported in Tables 1 and 2. Briefly, 81% were white, 61% were greater than 25 years old, 75% were female, and 89.1% saw a physician in the past 12 months in the pilot sample (see Table 1).

Internal Consistency and Reliability. The exploratory factor analysis (principal component analysis with Varimax Rotation) identified a 17-item MTHCSS with 3 factors (subscales). The eigenvalues for the 3 components were 6.29, 2.40, and 1.30, respectively. These 3 components of the scale explained 59% of the variance. The loadings for the rotated items ranged between 0.656 and 0.834 (See Table 3). All individual items correlated at greater than or equal to .5 with at least 1 factor and did not correlate at greater than .3 with the other 2 factors²⁹. The factors (subscales) for the revised scale were: trust in the health care providers subscale (10 items), trust in the health care payers subscale (4 items), and trust in health care institutions subscale (3 items). Cronbach's α for the total scale was 0.86 and 0.90, 0.75, and 0.72, respectively, for the 3 subscales. The Cronbach's α for the total and 3 subscales were within the generally recommended range of 0.70–0.90²⁹. The psychometric properties of each individual item and the total scale of the MTHCSS in the pilot sample are reported in Table 4.

Phase 2: Evaluation of Final Instrument

Three hundred one patients participated in the phase 2 study (final sample). The demographic characteristics of the final sample are reported in Table 2. Briefly, 49% were white, and 48% were African American. Approximately 65% were female, 60% were at least 50 years old, and 95% saw their provider in the past 12 months. The mean MTHCSS score for the final sample was 63.0 (SD 8.8). The mean score for the Trust in Health Care Providers Subscale was 40.0 (SD 6.2), whereas the mean score for the Trust in Health Care Payers Subscale was 12.8

(SD 3.0), and the mean score for the Trust in Health Care Institutions Subscale was 10.3 (SD 2.1). The psychometric properties of each individual item and the total scale of the MTHCSS in the final sample are reported in Table 5. Mean total MTHCSS scores are reported by demographic characteristic in Table 6. Mean scores differed by gender ($p=.04$), race/ethnicity ($p=.03$), and having a usual source of care ($p=.01$). Trust scores were significantly lower among women, African Americans, and Hispanics and those without a usual source of care.

Internal Consistency and Reliability. Three factors (subscales) emerged from the confirmatory factor analysis (principal component analysis with Varimax Rotation) of the revised 17-item MTHCSS. The eigenvalues for the 3 components were 7.07, 2.26, and 1.10, respectively. These components of the scale explained 61% of the variance. The loading for the rotated items ranged between 0.36 and 0.86 (See Table 3). All individual items correlated at greater than or equal to .5 with at least 1 factor and did not correlate at greater than .3 with the other 2 factors²⁹. Cronbach's α for the total scale was 0.89 and 0.92, 0.74, and 0.64, respectively, for the 3 factors (subscales) in the final sample. The psychometric properties of each individual item and the total scale of the MTHCSS in the final sample are reported in Table 5.

MTHCSS Correlations with Trust Related Constructs. Significant correlations were observed between the MTHCSS and measures of patient-centered care, locus of control, medication adherence, social support, and patient satisfaction (See Table 7).

Table 3. Component Loadings of the Principal Component Analysis after Varimax Rotation for Pilot (P) and Final Sample (F)

Items	Components					
	1		2		3	
	P	F	P	F	P	F
Subscale 1: Trust in Health Care Providers						
1 My health care provider is usually considerate of my needs and puts them first	0.73	0.75	0.02	-0.18	0.21	0.07
2 I have so much trust in my health care provider that I always try to follow his/her advice	0.74	0.80	-0.08	-0.19	0.19	0.01
3 I trust my health care provider so much that whatever he/she tells me, it must be true	0.67	0.75	0.10	-0.11	0.04	-0.03
4* Sometimes, I do not trust my health care provider's opinion and therefore I feel I need a second one	0.67	0.48	0.18	-0.10	-0.18	0.13
5 I can trust my health care providers judgments concerning my medical care	0.80	0.77	-0.01	-0.18	0.13	-0.08
6 My health care provider will do whatever it takes to give me the medical care that I need	0.68	0.83	0.14	-0.19	0.21	0.001
7 Because my health care provider is an expert, he is able to treat medical problems like mine	0.66	0.77	-0.07	-0.23	0.19	-0.17
8 I can trust my health care provider's decisions on which medical treatments are best for me	0.79	0.83	0.05	-0.22	0.18	-0.13
9 My health care provider offers me the highest quality in medical care	0.77	0.83	0.10	-0.20	0.26	0.05
10 All things considered, I completely trust my health care provider	0.83	0.86	0.05	-0.18	0.12	-0.03
Subscale 2: Trust in Health Care Payers						
11 Health care payers are good at what they do	0.13	0.39	0.74	0.53	0.09	-0.22
12 When needed, health care payers will pay for you to see any specialist	0.01	0.38	0.66	0.59	0.20	-0.21
13 When questioned about what treatments are covered, health care payers are honest with their answers	0.03	0.39	0.82	0.65	0.03	-0.27
14 Health care payers will pay for everything they are supposed to, including treatment that is expensive	0.02	0.32	0.74	0.60	0.12	-0.32
Subscale 3: Trust in Health Care Institutions						
15* Health care institutions only care about keeping medical costs down, and not what is needed for my health	0.12	0.25	0.12	0.29	0.74	0.67
16 Healthcare institutions provide the highest quality in medical care	0.23	0.49	0.15	0.41	0.77	0.42
17 When treating my medical problems, health care institutions put my medical needs above all other considerations, including costs	0.27	0.48	.22	0.51	0.72	0.36

*Items 4 and 15 are reverse scored

Table 4. Items and Statistical Measures of the MTHCSS in Pilot Sample

Item number	Wording of items	Means (SD)	Item selectivity	Cronbach's α without item
	Subscale 1: Trust in Health Care Providers ($\alpha=0.90$)	26.0 (6.0)		
1	My health care provider is usually considerate of my needs and puts them first	2.2 (0.7)	0.58	0.74
2	I have so much trust in my health care provider that I always try to follow his/her advice	2.5 (1.0)	0.52	0.74
3	I trust my health care provider so much that whatever he/she tells me, it must be true	3.5 (0.9)	0.49	0.74
4*	Sometimes, I do not trust my health care provider's opinion and therefore I feel I need a second one	3.4 (0.9)	0.48	0.81
5	I can trust my health care providers judgments concerning my medical care	2.3 (0.7)	0.60	0.74
6	My health care provider will do whatever it takes to give me the medical care that I need	2.5 (0.9)	0.60	0.73
7	Because my health care provider is an expert, he is able to treat medical problems like mine	2.4 (0.8)	0.48	0.74
8	I can trust my health care provider's decisions on which medical treatments are best for me	2.3 (0.6)	0.64	0.73
9	My health care provider offers me the highest quality in medical care	2.5 (0.8)	0.67	0.73

Table 4. (continued)

Item number	Wording of items	Means (SD)	Item selectivity	Cronbach's α without item
10	All things considered, I completely trust my health care provider	2.4 (0.8)	0.63	0.73
	Subscale 2: Trust in Health Care Payers ($\alpha=0.75$)	13.3 (3.1)		
11	Health care payers are good at what they do	3.2 (1.0)	0.35	0.75
12	When needed, health care payers will pay for you to see any specialist	3.4 (1.1)	0.28	0.76
13	When questioned about what treatments are covered, health care payers are honest with their answers	3.1 (1.0)	0.33	0.75
14	Health care payers will pay for everything they are supposed to, including treatment that is expensive	3.6 (1.0)	0.28	0.76
	Subscale 3: Trust in Health Care Institutions ($\alpha=0.72$)	8.4 (2.3)		
15*	Health care institutions only care about keeping medical costs down, and not what is needed for my health	2.6 (1.0)	0.39	0.81
16	Healthcare institutions provide the highest quality in medical care	2.6 (0.8)	0.46	0.74
17	When treating my medical problems, health care institutions put my medical needs above all other considerations, including costs	3.2 (1.0)	0.49	0.74
	Total scale ($\alpha=0.86$)	47.6 (8.5)		

*Items 4 and 15 are reverse scored

Correlations between the MTHCSS and the Modified Picker Scale³⁰⁻³² (patient-centered care) ranged between $r=-.22$ and $r=.62$). A significant correlation between the MTHCSS was present on only 1 of the 3 Multidimensional Health Locus of Control Subscales³³: Powerful Others ($r=.42$, $p<.001$).

Table 5. Items and Statistical Measures of the MTHCSS in Final Sample

Item number	Wording of items	Means (SD)	Item selectivity	Cronbach's α without item
	Subscale 1: Trust in Health Care Providers ($\alpha=0.92$)	40.0 (6.2)		
1	My health care provider is usually considerate of my needs and puts them first	4.3 (0.7)	0.63	0.88
2	I have so much trust in my health care provider that I always try to follow his/her advice	4.2 (0.8)	0.67	0.88
3	I trust my health care provider so much that whatever he/she tells me, it must be true	3.6 (1.0)	0.65	0.88
4*	Sometimes, I do not trust my health care provider's opinion and therefore I feel I need a second one	3.2 (1.1)	0.39	0.89
5	I can trust my health care providers judgments concerning my medical care	4.1 (0.7)	0.65	0.88
6	My health care provider will do whatever it takes to give me the medical care that I need	4.1 (0.8)	0.70	0.88
7	Because my health care provider is an expert, he is able to treat medical problems like mine	4.0 (0.7)	0.64	0.88
8	I can trust my health care provider's decisions on which medical treatments are best for me	4.1 (0.7)	0.71	0.87
9	My health care provider offers me the highest quality in medical care	4.1 (0.7)	0.70	0.88

Table 5. (continued)

Item number	Wording of items	Means (SD)	Item selectivity	Cronbach's α without item
10	All things considered, I completely trust my health care provider	4.1 (0.8)	0.75	0.87
	Subscale 2: Trust in Health Care Payers ($\alpha=0.74$)	12.8 (3.0)		
11	Health care payers are good at what they do	3.4 (0.9)	0.40	0.89
12	When needed, health care payers will pay for you to see any specialist	3.1 (1.1)	0.40	0.89
13	When questioned about what treatments are covered, health care payers are honest with their answers	3.3 (0.9)	0.43	0.88
14	Health care payers will pay for everything they are supposed to, including treatment that is expensive	3.0 (1.1)	0.35	0.89
	Subscale 3: Trust in Health Care Institutions ($\alpha=0.64$)	10.3 (2.1)		
15*	Health care institutions only care about keeping medical costs down, and not what is needed for my health	3.5 (1.0)	0.25	0.89
16	Healthcare institutions provide the highest quality in medical care	3.5 (0.8)	0.49	0.88
17	When treating my medical problems, health care institutions put my medical needs above all other considerations, including costs	3.4 (0.9)	0.49	0.88
	Total scale ($\alpha=0.89$)	63.0 (8.8)		

*Items 4 and 15 are reverse scored

Significant correlations also existed between the MTHCSS and (1) the Morisky Scale of Medication NonAdherence³⁴ ($r=-.22$, $p<.001$) and (2) the MOS Scale of Social Support³⁵ ($r=.253$, $p<.001$). Finally, there were significant correlations between the MTHCSS

Table 6. Mean MTHCSS Scores by Sample Characteristics in the Final Sample

Final sample (n=301)	Mean (SD)	p values
Age		
<35 years	61.5 (8.9)	$p=.19$
35–49 years	61.7 (9.5)	
50–64 years	63.6 (7.0)	
65+ years	64.5 (10.1)	
Sex		
Women	62.1 (8.9)	$p=.04^*$
Men	64.3 (8.7)	
Race/Ethnicity		
White	64.3 (8.2)	$p=.03^*$
African American	61.5 (9.2)	
Hispanic/other	61.4 (11.9)	
Marital status		
Single	62.1 (9.0)	$p=.77$
Married	62.9 (8.9)	
Separated/divorced	63.2 (8.2)	
Widowed	64.2 (9.8)	
Educational level		
<High school graduate	63.4 (10.7)	$p=.94$
High school graduate	62.8 (8.5)	
<College graduate	63.2 (9.3)	
≥College graduate	62.5 (8.1)	
Insurance status		
Private insurance	62.6 (8.8)	$p=.05$
Government insurance	64.4 (9.2)	
Uninsured	59.1 (6.5)	
Income		
<\$10,000	63.4 (8.2)	$p=.41$
<\$25,000	62.7 (9.1)	
<\$35,000	63.3 (8.9)	
<\$50,000	62.8 (6.8)	
<\$75,000	61.1 (10.2)	
<\$100,000	65.9 (7.5)	
\$100,000+	62.6 (9.4)	
Usual source of care		
Yes	63.4 (8.4)	$p=.01^*$
No	59.7 (10.8)	
Saw health provider past 12 months		
Yes	63.1 (8.7)	$p=.76$
No	62.4 (9.5)	
Used Emergency room past 12 months		
Yes	63.2 (8.8)	$p=.67$
No	62.7 (8.9)	
Number of health provider visits in past 12 months		
0/1	60.8 (12.1)	$p=.14$
2	61.6 (7.2)	
3	65.9 (6.8)	
4	64.2 (9.3)	
5+	63.6 (8.3)	
Number of emergency department visits in past 12 months		
0	61.9 (9.7)	$p=.24$
1	62.3 (8.7)	
2	62.2 (7.7)	
3	67.8 (7.2)	
4+	65.9 (8.9)	

*Statistically significant

total scale score and patient satisfaction ($r=.67$, $p<.001$) and dissatisfaction ($r=.45$, $p<.001$) with care.

DISCUSSION

We developed and tested a 17-item MTHCSS to examine the multiple objects of trust in the health care system. This scale includes items designed to measure trust in health care providers (10 items), trust in the health care payers (4 items),

and trust in health care institutions (3 items). The psychometric properties of the MTHCSS indicate good reliability, validity, and acceptable psychometric properties. Similar psychometric properties were observed across 2 populations: college students and adults receiving care in primary care clinics. The MTHCSS has a high internal consistency ($\alpha=.89$), suggesting that the 3 objects of trust can be captured in 1 scale.

The inclusion of 3 subscales is supported by the findings of Boulware et al.,²⁵ which suggested that patterns of trust in physicians, health insurance plans, and hospitals can differ as a reflection of divergent experiences with the individual components of the health care system. Therefore, scales designed to measure trust should be multidimensional to account for the interplay between physicians, health insurance plans, and hospitals.

The MTHCSS was significantly correlated with established measures of patient-centered care, health locus of control, medication nonadherence, social support, and patient satisfaction. Scores on 5 of 6 items on the Modified Picker Scale^{30–32} showed significant correlations with patient trust. Patients who receive patient-centered care are more likely to have trust in the health care system. The final item, a negatively worded item regarding the patient's ability to ask the physician questions during the visit, was also significantly correlated in a negative direction. Medication nonadherence (Morisky Scale)³⁴ was negatively associated with trust indicating that trusting patients are

Table 7. Correlations Between the MTHCSS and Measures of Patient-centered Care, Health Locus of Control, Medication Adherence, Social Support, and Patient Satisfaction

Measure	Correlation value
Patient-centered care—Modified Picker Scale	
Does your physician give you enough time to explain the reason for your visit?	0.62*
When you ask questions, do you get answers that are understandable?	0.51*
Does your physician take enough time to answer your questions?	0.60*
Does your physician ask you about how your family or living situation might affect your health?	0.45*
Do you get as much medical information as you want from your physician?	0.67*
When you see your physician, do you have questions about your care that you want to discuss but do not?	−0.22*
Are you involved in decisions about your care as much as you want?	0.47*
Health locus of control—Multidimensional Locus of Control Scale	
Internal (i.e., health/illness is determined by self)	0.10
Powerful others (i.e., health/illness is determined by others)	−0.04
Chance (i.e., health/illness is determined by luck or chance)	0.42*
Medication nonadherence—Morisky Scale	
Total scale	−0.22*
Social support—MOS Scale of Social Support	
Total scale	0.25*
Satisfaction/dissatisfaction with care	
Looking over the past 12 months, I can say that I am very satisfied with the care received from my primary care provider	0.67*
Looking over the past 12 months, I can say that I am very dissatisfied with the care received from my primary care provider	−0.45*

*Statistically significant correlations at $p<.05$

more likely to take their medication as prescribed. Similarly, social support (MOS Scale of Social Support)³⁵ and patient satisfaction were associated with trust. In summary, patients with more social support and satisfaction with their level of care were most likely to report greater trust.

Given that very few previously developed scales to measure trust capture the multiple objects of trust in the health care system concurrently,^{6–19} the multidimensional nature of this scale enables more accurate characterizations of trust in the health care system. This is especially important for studies of trust/distrust between racial/ethnic groups. The MTHCSS documented significant differences in trust across racial/ethnic groups with African Americans and Hispanics having lower levels of trust compared to whites. However, more studies are needed to validate this finding in diverse population groups and determine whether racial/ethnic differences in the different objects of trust influence health outcomes. The MTHCSS provides a valid and reliable tool for such studies.

This study has some limitations. First, the participants in the final study were recruited from 1 university clinic in the southeastern United States, and approximately 95% had health insurance. Therefore, it is uncertain how the scale will perform in other populations with different demographic characteristics. Additional studies are needed to examine the psychometric properties of the MTHCSS in diverse patient populations. Second, because of the small proportion of subjects in the final sample without a usual source of care (approximately 13%); the finding of lower levels of trust in patients without a usual source of care needs to be replicated.

In conclusion, the 17-item MTHCSS is a valid and reliable instrument to measure the multiple objects of trust in the health care system, and the psychometric properties of the scale were consistent across 2 diverse populations—college students and adults receiving care in primary care clinics.

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