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ORIGINAL PAPER

Factors responsible for healthcare avoidance among rural adults in the Eastern Region of North Carolina

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Abstract

Purpose Previous research has identified three common reasons for healthcare avoidance, cost, complexity, and privacy. This study extends prior work by examining the antecedents to these barriers and determining the extent to which they contribute to healthcare avoidance in a rural population.

Methods A cross-sectional, regional survey of rural residents from Eastern North Carolina was conducted with questions focused on self-perceived health, healthcare utilization, and healthcare avoidance. Bivariate logistic regression was employed to investigate the predictors of cost, complexity, and privacy-related avoidance.

Results Among 946 respondents, a quarter of the sample (N = 240) had not visited a doctor within the past year. Respondents who were uninsured were almost 6-times more likely to endorse avoiding healthcare due to cost (OR = 5.98) and those who had a chronic illness were 3-times as likely to report cost-related avoidance (OR = 3.01). Complexity-related avoidance was predicted by having a chronic illness (OR = 3.77) and a low perception of healthcare value (OR = 2.80). Lastly, privacy-related avoidance was related to being in fair/poor health (OR = 2.61), having a chronic illness (OR = 2.63), reporting low healthcare value (OR = 2.72), and having an external locus of control (OR = 2.96).

Conclusions Among avoidant individuals, those with a chronic illness, who could benefit most from continuity of healthcare, are 3-times more likely to avoid healthcare due to cost, complexity, and privacy. The perceived value of healthcare is also associated with complexity- and privacy-related healthcare avoidance. Utilizing alternative methods of healthcare delivery, such as telemedicine and free or reduced cost mobile health clinics, could improve continuity of medical care for rural residents.

Keywords Utilization of health services · Health disparities · Health services research

Introduction

The avoidance of medical care has many significant costs, spanning a direct monetary cost in the form of expensive medical interventions to the potential loss of life or quality of life when diseases are left untreated. As researchers have sought to identify reasons for healthcare avoidance, three themes have begun to emerge. First, although access to health insurance coverage has expanded over the past several years, patients continue to avoid preventative services and delay medical care due to the anticipated financial burden. Even with health insurance, out-of-pocket costs and high deductible plans create a cost barrier that leaves medical care out of reach for many Americans [13, 21, 23, 26]. A second commonly reported barrier to healthcare access is the time and complexity involved in navigating the healthcare system. These inconvenience related burdens include the administrative burden of navigating care and reimbursement systems [15], a lack of available time [7, 14, 23], and limited transportation resources [27]. Lastly, fear of a possible privacy breach and disclosure of sensitive medical information is a cause of avoidance for some patients [5, 22].

Residents of rural communities are disproportionately affected by each of these barriers to healthcare and unique structural and cultural factors further impede access. For these residents, healthcare is plagued by provider shortages and fragmented care requiring services from multiple, geographically dispersed providers [3]. A recent survey of rural

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adults found that one in three respondents had difficulty paying their medical bills and more than one in four had a recent issue accessing health care, including 23 percent who cited inaccessible healthcare locations [8]. Issues of privacy are also amplified in rural communities where a limited provider presence and small social circles present barriers to ensuring anonymity [3]. A perceived lack of confidentiality can contribute to mistrust and erode the provider-patient relationship.

Previous research has identified common drivers of healthcare avoidance, however the antecedents of these barriers and the extent to which they contribute to a particular reason for avoidance in a rural population have not been explored. In the current study, a cross-sectional survey was administered to residents of eastern North Carolina to assess healthcare utilization and characterize predictors associated with cost, complexity, and privacy-related healthcare avoidance.

Methods

A cross-sectional, regional survey was conducted with questions focused on self-perceived health, healthcare utilization, and healthcare avoidance. Subjects were eligible if they resided in the Eastern region of the state of North Carolina and were 18 years or older. Avoider status was determined based on the responses to two questions, "Have you visited a doctor for health care other than for an emergency within the last year?" and "How many years has it been since you visited a doctor's office for something other than an emergency?" If the respondent endorsed visiting a doctor in the last year, they were considered a "non-avoider." Respondents who answered "no" to the first question were categorized as "avoided for last 1–5 years" or "avoided for more than 5 years" based on their response to the second question. Participants were asked about reasons for healthcare avoidance in three separate questions that defined the reason for avoidance as either cost, complexity, or privacy related. Participants could endorse none of these reasons, or any combination of reasons for avoidance.

Respondents were contacted using a mixed mode approach of telephone interactive voice response (IVR) system (landlines only) and an online opt-in panel. Phone numbers for the IVR calls were randomly sampled, provided by Aristotle, Inc. (Washington, D.C.), and yielded 524 completed responses. The online sample (422 completed responses) was recruited by Lucid, Inc. (New Orleans, LA). Online participants were compensated for their participation. For the combine sample of 946, the Bayesian credible interval was +/- 3.7% points. Poststratification person-level weights were applied to survey results for all analyses to represent the sociodemographic characteristics of the region. Control values used for the raking adjustment were obtained from the US Census. An iterative proportional fitting algorithm was implemented based on four dimensions: age, education, race, and gender.

County-level counts of federally qualified health centers (FQHC) and densities of primary care physicians were determined using the 2019–2020 area health resource file compiled by the Health Resources and Services Administration in conjunction with the Bureau of Health Workforce and the National Center for Health Workforce Analysis. Density of primary care physicians was calculated as a ratio of primary care physicians (including non-Federal MDs and DOs, excluding hospital residents and physician aged 75 or older) to county population. This study was reviewed and approved by an Institutional Review Board in accordance with FDA criteria 21 CFR part 56.

Data analyses

To investigate differences in demographic, health, and healthcare access variables among the three avoider status groups chi-square and Kruskal-Wallis tests were performed. To explore the influence of age and self-perceived health status on healthcare avoidance we conducted a multivariate logistic regression including an interaction term (age x health status). Insurance status (insured vs. uninsured) was included as a co-variate. For this analysis, self-perceived health status was separated into three groups: poor health, good/fair health (those reporting good or fair health status), and excellent health. Participant age was also divided into three groups: young (18–34), middle (35–64), and older (≥ 65). Logistic regression model estimated probabilities of avoidance were calculated for individuals in each health status group and for each age group.

For all avoiders (participants who reported not seeing a healthcare provider in the previous year) a series of bivariate logistic regressions were employed to investigate and compare predictors of three reasons for healthcare avoidance: cost, complexity, and privacy. Regressions were first adjusted for significant demographic variables prior to the addition of the predictor variables, which included insurance status, self-reported health status, chronic illness, perceived value of healthcare, internal health locus of control, and external health locus of control. Odds ratios and 95% confidence intervals were calculated for each predictor.

SPSS version 27 (IBM, Inc., New York, NY) was used for all analyses. SAS Proc Logistic (the SAS 9.4 statistical package; SAS Institute, Cary, NC) was used to compute estimated probabilities of avoidance. A p-value < 0.05 was considered statistically significant.

Results

The final dataset included 946 participants from eastern

Table 1 Demographic distribution of respondents by avoider status

		Avoider Status		
	Full Sample	Non-avoider	Avoided for last 1 to 5 years	Avoided for more than 5 years
n	946	706 (74.6)	156 (16.5)	84 (8.9)
Age**				
18–34	303 (32.0)	189 (62.4)	74† (24.4)	40† (13.2)
35–64	435 (46.0)	345 (79.3)	58† (13.3)	32 (7.4)
≥65	208 (22.0)	171 (82.2)	25† (12.0)	12† (5.8)
Sex				
Female	476 (50.3)	355 (74.6)	86 (18.1)	35 (7.4)
Male	466 (49.3)	348 (74.7)	69 (14.8)	49 (10.5)
Hispanic/Latino	76 (8.0)	59 (77.6)	11 (14.5)	6 (7.9)
Race				
African American	284 (30.0)	203 (71.5)	50 (17.6)	31 (10.9)
Caucasian	544 (57.5)	416 (76.5)	86 (15.8)	42 (7.7)
Educational Attainment				
≤High School	445 (47.0)	321 (72.1)	76 (17.1)	48 (10.8)
Some College	331 (35.0)	248 (74.9)	54 (16.3)	29 (8.8)
College Degree	114 (12.1)	89 (78.1)	21 (18.4)	4 (3.5)
Graduate Degree	56 (5.9)	48 (85.7)	5 (8.9)	3 (5.4)
Annual Income				
<$25,000	276 (29.2)	199 (72.1)	40 (14.5)	37 (13.4)
$25–50,000	296 (31.3)	214 (72.3)	56 (18.9)	26 (8.8)
>$50–100,000	184 (19.5)	145 (78.8)	27 (14.7)	12 (6.5)
>$100,000	83 (8.8)	66 (79.5)	11 (13.3)	6 (7.2)
Insurance Status**				
Insured	771 (81.5)	623 (80.8)	112† (14.5)	36†† (4.7)
Uninsured	151 (15.9)	65 (43.3)	43† (28.7)	42†† (28.0)
Health Status*				
Excellent	192 (20.3)	137 (71.4)	31 (16.1)	24† (12.5)
Good	460 (48.6)	339 (73.7)	76 (16.5)	45 (9.8)
Fair	244 (25.8)	192 (78.7)	44 (18.0)	8† (3.3)
Poor	51 (5.4)	38 (74.5)	6 (11.8)	7 (13.7)
Chronic Illness**				
Yes	508 (53.7)	424 (83.5)	60† (11.8)	24† (4.7)
No	439 (46.4)	282 (64.2)	97† (22.1)	60† (13.7)
Prescription Medication**				
Yes	434 (45.9)	386 (88.9)	37† (8.5)	11† (2.5)
No	73 (7.7)	37 (50.7)	23† (31.5)	13† (17.8)
Healthcare Value**				
Yes	764 (80.8)	603 (78.9)	126 (16.5)	35† (4.6)
No	175 (18.5)	103 (58.9)	30 (17.1)	42† (24.0)
Internal Health LOC*				
Yes	904 (95.6)	679 (75.1)	150 (16.6)	75† (8.3)
No	43 (4.5)	27 (62.8)	7 (16.3)	9† (20.9)
External Health LOC				
Yes	531 (56.1)	403 (75.9)	80 (15.1)	48 (9.0)
No	415 (43.9)	302 (72.8)	77 (18.6)	36 (8.7)
Physician Density (median (IQR))	47.9 (35–69)	47.9 (35–69)	51.0 (44–69)	47.9 (35–69)
FQHC (median (IQR))	1 (1–4)	1 (1–4)	1 (1–2)	1 (1–3)

LOC - locus of control, FQHC - Federally Qualified Health Center

* $p < 0.05$, ** $p < 0.01$

† significantly different from Non-avoider group

†† significantly different from Non-avoider group and Avoided for last 1–5 years

North Carolina who were sampled at random. The sample was 50.3% female (N = 475) and 57.5% white (N = 544). All age groups were well represented in the sample, 18–34 (32%), 35–64 (46%), and 65 and older (22%). When asked to rate their overall health, the majority of participants reported being in good health (48.6%), followed by fair (25.7%), excellent (20.2%), and poor health (5.4%). Despite overall good ratings of health, over half the sample (53.7%) had a chronic health condition and the majority of these participants reported taking a prescription medication (85.6%).

Table 1 provides results of differences in demographic, health, and healthcare access variables based on avoider status (Table 1). Most participants (74.6%) were non-avoiders, 16.5% of the sample reported avoiding visiting a doctor in the last 1–5 years, and less than 10% of the sample (8.9%) had not been to the doctor in more than 5 years. Age was significantly related to avoider status. Among the youngest group of respondents (age 18–26) the proportion of individuals who avoided healthcare are greater than the expected proportion. Conversely, a higher proportion of older adults were classified as non-avoiders. Among the oldest group of respondents, those age 75 and older, only 16 people out of 85 reported being an avoider.

The majority of respondents (81.5%) were insured. Insurance status was significantly related to avoider status with high percentage of non-avoiders being insured (90.6%) compared to uninsured (3.4%). For those in the group that reported no healthcare access for more than 5 years, the percentage of insured and uninsured individuals was similar, 46.2% and 53.8%, respectively. Additional variables that were significantly related to avoider status included: health status, chronic illness, prescription medication, healthcare value, and internal locus of control.

Multivariate logistic regression was used to further explore the influence of age and self-perceived health status on healthcare avoidance. First, we classified age into three groups: 18–34, 35–64, and 65 or older. In the following analyses we controlled for insurance status given the correlation between insurance status and age, as well as insurance status and healthcare avoidance. As expected, in our first analysis age was a significant predictor of healthcare avoidance with respondents in the youngest cohort (age 18–34) being 2.02 times more likely to be in the avoider group compared to the oldest cohort (65 and older) (95% CI 1.28, 3.18, $p = 0.002$). Similarly, those age 35 to 64 were also more likely to avoid compared to the oldest cohort, however this was not statistically significant (OR = 0.91, 95% CI 0.58, 1.43, $p = 0.68$).

In the final analysis, an interaction term (age group x health status) was entered into the model. The final model was significant, predicted 17% of the variance in avoidance, and demonstrated a good fit to the data ($\chi^2 = 108.83$, $p < 0.001$, Nagelkerke $R^2 = 0.17$). Figure 1 shows the

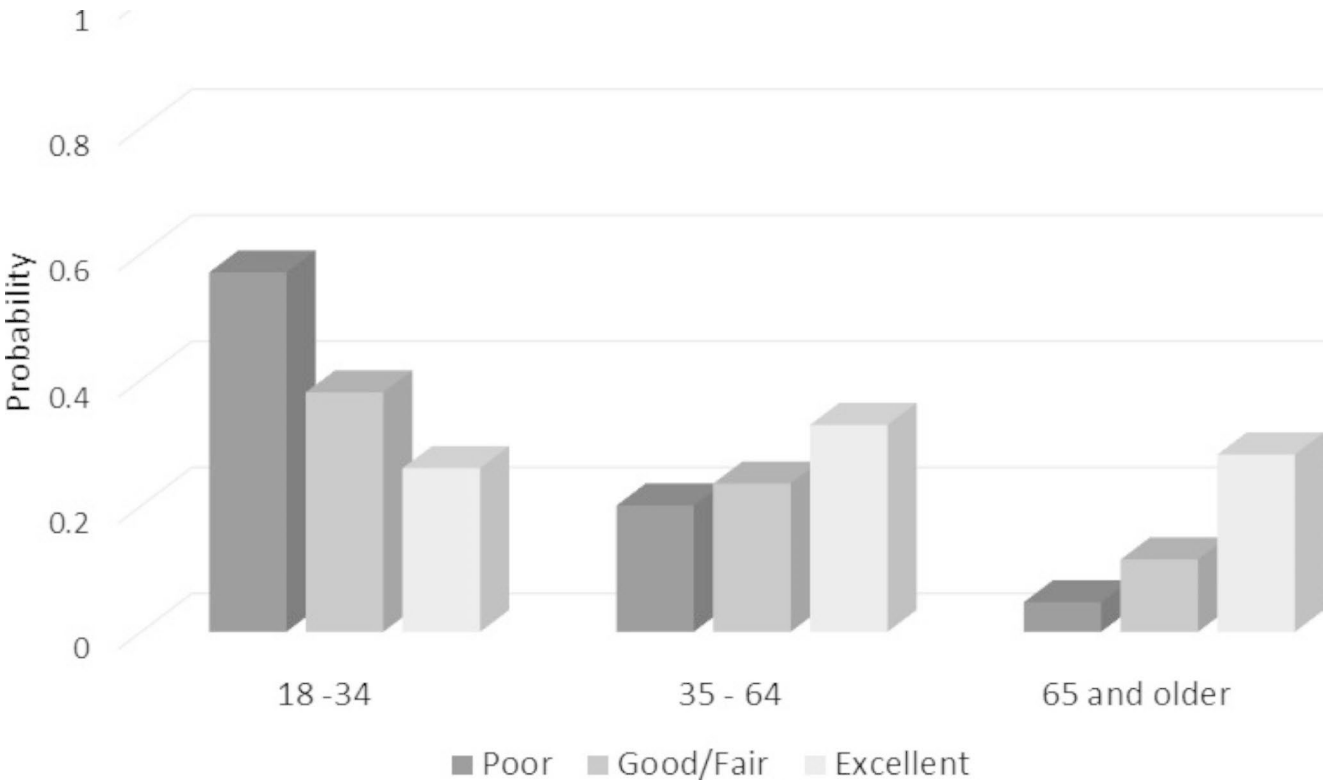

Fig. 1 Probability of avoiding healthcare by age and health status

probability of avoidance associated with each age group at each at each level of self-perceived health status.

Of the 240 participants who reported not seeing a healthcare provider in the last year, 78 (32.4%) reported cost as a factor, 69 (28.7%) reported complexity, and 30 (12.5%) cited privacy concerns as a reason for avoidance. Results from bivariate logistic regressions predicting reason for healthcare avoidance while controlling for age are found in Table 2. Significant predictors of cost-related avoidance included being uninsured and having a chronic illness. Respondents who were uninsured were almost 6 times more likely to endorse avoid healthcare due to cost (OR = 5.98, 95% CI 3.17, 11.26) and those who had a chronic illness were 3 times as likely to report cost-related healthcare avoidance (OR = 3.01, 95% CI 1.63, 5.55). Complexity-related avoidance was predicted by having a chronic illness (OR = 3.77, 95% CI 2.01, 7.09) and a low healthcare value (respondents reported their last visit to a healthcare provider was not helpful) (OR = 2.80, 95% CI 1.48, 5.31). Lastly, privacy-related avoidance was related to being in fair/poor health (OR = 2.61, 95% CI 1.09, 6.20), having a chronic illness (OR = 2.63, 95% CI 1.05, 6.58), reporting low healthcare value (OR = 2.72, 95% CI 1.15, 6.41), and having an external locus of control (OR = 2.96, 95% CI 1.21, 7.23).

Discussion

In our overall sample, we found that approximately a quarter of respondents reported avoiding medical care in the previous year, this is commensurate with rates of avoidance reported by others using a similar study design (i.e., polling survey) [15, 26]. Among our demographic predictors, only age was significantly related to avoidance. As expected, younger respondents had a greater likelihood of avoiding healthcare compared to older respondents. Despite high rates of health insurance coverage in our overall sample, including those who avoided healthcare for a year or more, cost was the most frequently cited reason for healthcare avoidance, followed closely by complexity and lastly, privacy. These results are consistent with previous findings that suggest cost and time are frequently reported barriers to accessing medical care [2, 4, 13, 15, 25].

A more extensive analysis of the relationship between age and perceived health on avoidance revealed that on average younger individuals are the most likely to avoid care; in particular, those with poor self-reported health are the most likely to avoid seeking healthcare compared to healthier peers. Our respondents in the oldest age group were the mostly likely to seek care, and in contrast to young respondents, older respondents with poor self-reported health are the group least likely to avoid healthcare. It is well documented that age is a predictor of health care avoidance with younger adults being most likely to delay or avoid medical care [10, 23, 24]. Initially it may seem counterintuitive for younger patients in poor health to avoid seeking care, however, several explanations for this outcome have been reported. First, younger patients tend to adopt a wait-and-see approach to disease or symptom management and may attempt to self-treat or expect their illness to resolve over time [16]. Second, for some chronically ill young adults there is a loss in the continuity of care as they transition from pediatric to adult healthcare which may also involve a loss or change in insurance coverage as they become ineligible for coverage under a parent's plan [12]. Lastly, shame and worry over perceived stigma by healthcare providers is another cause of avoidance for patients who do not view themselves to be in optimal physical condition [7, 18].

Previous reports of healthcare avoidance in older adults have been mixed. In adults aged 65 and older, Leyva and colleagues reported healthcare avoidance was highest among those with worse self-reported health [17]. Similarly, in older patients with a chronic condition, those who felt they worried more about their health than others their age were more than twice as likely to avoid health care [20]. In contrast to these results, we found that older adults with poor self-reported health are the least likely group to avoid medical care. As other investigators with similar results have indicated, we are unable to determine whether a respondent's perception of health is influenced by the act

Table 2 Comparing predictors of cost, complexity, and privacy-related avoidance

	Healthcare Avoider								
	Cost-related			Complexity-related			Privacy-related		
	Odds Ratio	95% CI	P	Odds Ratio	95% CI	P	Odds Ratio	95% CI	P
Model Step 1 (Age)			0.04			0.08			0.001
Insurance Status (Uninsured)	**5.98**	**3.17, 11.26**	**0.001**	4.90	0.89, 26.95	0.07	1.97	0.83, 4.67	0.13
Health Status (Fair/Poor)	1.22	0.65, 2.28	0.53	1.52	0.80, 2.86	0.2	**2.61**	**1.09, 6.20**	**0.03**
Chronic Illness	**3.01**	**1.63, 5.55**	**0.001**	**3.77**	**2.01, 7.09**	**0.001**	**2.63**	**1.05, 6.58**	**0.04**
Healthcare Value (Low)	1.58	0.85, 2.95	0.15	**2.80**	**1.48, 5.31**	**0.002**	**2.72**	**1.15, 6.41**	**0.02**
Internal Health LOC	1.13	0.34, 3.77	0.84	0.53	0.18, 1.61	0.26	0.60	0.13, 2.79	0.51
External Health LOC	0.89	0.50, 1.58	0.69	1.17	0.65, 2.10	0.60	**2.96**	**1.21, 7.23**	**0.02**

controlling for: age, LOC - locus of control

of visiting a healthcare provider and receiving a diagnosis or an indication that improvements could be made to their health, thereby shaping the patients' perception of their own health [11].

Evaluating reason-specific causes of avoidance, we found that predictors of cost-related avoidance include being uninsured and having a chronic medical diagnosis. Having a chronic illness, along with a devalued perception of healthcare, were predictive of avoidance due to complexity. Navigating the healthcare system involves a multitude of tasks from finding an in-network provider and scheduling an appointment, which may occur months in the future, to ambiguous costs, decision making, and treatment management. For many patients, especially those with a chronic illness requiring frequent interactions with the healthcare system, it is easy to become overwhelmed by the seemingly endless number of administrative tasks [15]. Results from studies utilizing the Health Information National Trends Survey found that physician distrust, poor provider rapport, and poor physician communication were related to healthcare avoidance [14, 24, 25]. Due to the high cognitive cost of engagement with the healthcare system, it is imperative that patients derive some perceived benefit from the encounter with their provider.

National reports detailing data breaches have led to an increase in the public's awareness of data vulnerability, including health data privacy. Fears regarding the sharing of personal health information, intentionally or otherwise, has caused some individuals to avoid seeking healthcare. Chan and Laster reported that patients who believed their personal health information was not being protected were more likely to avoid doctor visits than those who felt their information was secure [5]. Although overall rates of privacy-related avoidance were low in our sample, we found that privacy-related avoidance was predicted by poor self-perceived health, having a chronic illness, a low perceived value of healthcare, and an external locus of control.

The level of healthcare avoidance in this population, particularly among young adults with poor self-reported health warrants the exploration of interventions designed to improve engagement with the healthcare system. Worksite based screenings have gained attention as a non-traditional method of preventative healthcare delivery for the strategic, early detection of modifiable risk factors. In a sample of patient who were employed but socioeconomically disadvantaged, Abbas and colleagues, found that worksite-based screenings followed by appropriate referral improved self-reported and objective measures of health, including body mass index and cardiovascular disease risk scores [1]. Given the low wages, long work hours, and prevalence of a minority workforce, agricultural workers and other rural populations may derive the greatest benefit from worksite-based health screenings [6, 9, 19].

Limitations

We acknowledge that this study was not without limitations. First, our survey was limited to residents eastern North Carolina; therefore, our findings may not be generalizable to populations with a different sociodemographic composition, particularly non-rural populations. Although our sample was not nationally representative, it was racially and economically diverse and our inferential analyses were appropriately weighted to account for differences in the demographics of our sample and our target region. Second, while we sought to understand causes of healthcare avoidance, we limited our responses to cost, complexity, and privacy. Although these represent the most commonly cited reasons for avoidance, they are not all-encompassing and several other possible reasons for avoidance were not included. Lastly, in the current study we were unable to ascertain whether adults who avoided healthcare did so because they were objectively not in need of medical intervention (i.e., I am in good/excellent health and therefore do not need to visit a doctor) or if they do need care and their avoidance created a state of cognitive dissonance (i.e., I have not been to the doctor therefore I must be in good health) resulting in a self-reported evaluation of good/excellent health. Limitations of response accuracy are inherent in self-report data and our findings should be interpreted with consideration of these limitations.

Conclusions

Cost and complexity were the most commonly cited reasons for healthcare avoidance followed by privacy concerns. Having a chronic illness was predictive of all three reasons for avoidance while being uninsured and reporting a lower perceived value of healthcare was associated with cost and complexity-related avoidance, respectively. Age is significantly related to avoidance with younger participants being the least likely to have visited a doctor in the previous year. Among participants in the youngest age group, those in poor health were twice as likely to report healthcare avoidance compared to those in excellent health. Among participants age 65 and older, the opposite relationship was found, in this group those in poor health were the least likely to avoid healthcare. Future research should investigate the implementation of interventions that allow for engagement with the healthcare system while reducing the cost, complexity, and privacy concerns that present a barrier for many individuals.

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Code Availability NA.

Declarations

Conflicts of interest/Competing interests: The authors declare they have no conflicts of interest.

Ethics approval: UMCIRB approved this study.

Consent to participate: study participation was accepted as consent in place of signed consent.

Consent for publication: All authors consent to publication.

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