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Predictors of Past-Year Health Care Utilization Among Young Men Who Have Sex with Men Using Andersen's Behavioral Model of Health Service Use

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Abstract

Purpose: This study examined factors associated with past-year health care utilization among young gay, bisexual, and other men who have sex with men (YMSM) using Andersen's behavioral model of health service use.
Methods: From 2018 to 2020, 751 YMSM (aged 13–18) recruited online and offline for the MyPEEPS mHealth HIV prevention study completed an online survey. Hierarchical logistic regression models assessed associations between past-year health care utilization (i.e., routine checkup) and predisposing (parental education, race/ethnicity, age, and internalized homonegativity), enabling (health literacy, health care facility type, U.S. Census Divisions), and need factors (ever testing for HIV).
Results: The sample included 31.8% Hispanic, 23.9% White, and 14.6% Black YMSM; median age was 16. Most (75%) reported past-year health care utilization, often from private doctor's offices (29.1%); 6% reported no regular source of care. In the final regression model, higher odds of past-year health care utilization were found for younger participants (age 13–14, adjusted odds ratio [AOR] = 1.91; 95% confidence interval [CI]: 1.07–3.43; age 15–16 AOR = 1.55; 95% CI: 1.04–2.30; reference: 17–18) and those with increasing health literacy (AOR = 1.71; 95% CI: 1.36–2.16). YMSM with lower parental education had lower odds of past-year health care utilization (AOR = 0.56; 95% CI: 0.38–0.84), as did those relying on urgent care facilities (AOR = 0.60; 95% CI: 0.41–0.87; reference: routine care facilities) and those who identified as Mixed/Other race (AOR = 0.50; 95% CI: 0.28–0.91; reference: White).
Conclusions: Findings highlight opportunities to intervene in YMSM's health risk trajectory before age 17 to reduce drop-off in routine health care utilization. Interventions to improve routine health care utilization among YMSM may be strengthened by building resilience (e.g., health literacy) while removing barriers maintained through structural disadvantage, including equity in education.
Clinical Trial Registration Number: NCT03167606.

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Introduction

$\mathbf{Y}$OUNG GAY, BISEXUAL, and other men who have sex with men (YMSM) in the United States face numerous chronic and acute health disparities, including HIV and substance use.[1,2] Public health initiatives such as Healthy People 2030 seek to counteract these disparities by increasing routine health care utilization.[3] Data suggest nationwide success in increasing routine health care utilization among adolescents overall, with 81.7% of adolescents receiving at least one preventative care visit in 2018.[4] However, past research has shown that health care utilization noticeably decreases among boys and young men as they grow older; 36% of all 13-year-old adolescent men in the United States in 2014 reported not having a primary care visit in the past year compared with 53% among 18-year-olds.[5]

Although some evidence suggests YMSM may be equally or more likely to utilize health care than their heterosexual peers,[6,7] other data signal that YMSM are more likely to delay seeking care[8,9] and report significantly greater unmet health care needs.[7,10] Despite a growing body of literature on adult MSM and health care utilization, there remains a need to further identify factors that inhibit or facilitate routine health care utilization among YMSM across the United States.

Andersen's model of health service use

Andersen's behavioral model of health service use ("Andersen's model") allows the examination of health care utilization, including elements of inequitable access to care.[11] Andersen's model contains three main domains: predisposing, enabling, and need factors. Predisposing factors are theoretically antecedent to worse health outcomes and may be indicative of structural disadvantage, including educational disparities. Enabling factors, which represent the logistical aspects of obtaining care, include having a health care provider, health insurance, and geographic region. Need factors can represent an individual's self-perception (i.e., perceived need) of their health as well as a more objective evaluation (i.e., evaluated need) by a health provider.[11] Research has shown that the social and structural factors highlighted in Andersen's behavioral model provide a solid groundwork to assess multiple layers of influence on population health care utilization,[12,13] thereby identifying potential avenues for intervention.

Andersen's model among MSM and adolescents

Among adolescents and young adults, predisposing factors (e.g., education, parental education, and participant age) and enabling factors (e.g., geographic region) have all been linked to the utilization of a variety of health services.[14,15] However, despite the noted barriers and low annual health care use among adolescent men overall,[5] few studies grounded in Andersen's model have sought to understand routine health care utilization among YMSM in particular.[16]

Health care needs of YMSM, and their experiences in health care settings, differ from those of their heterosexual peers. A number of predisposing and enabling factors serve as barriers to health care utilization among YMSM, including cost,[8,10] underinsurance,[14] and stigma in health care settings,[17–20] including difficulty finding an affirming provider. In one study of early adult MSM aged 18–29 years old, younger age and lower income were associated with preference for fragmenting primary care away from sexual health care,[16] which may unintentionally reduce routine health care utilization.

This study utilizes Andersen's model to examine predisposing, enabling, and need factors that act as barriers to, and facilitators of, past-year health care utilization among a diverse nationwide online sample of YMSM.

Methods

Study design and participants

The study analyzed baseline data from a longitudinal randomized controlled trial of a mobile HIV prevention app that was conducted from 2018 to 2020 among adolescent MSM aged 13–18 years. Other eligibility criteria included being cisgender men, being sexually attracted to men, self-reporting as HIV-negative, having access to a smartphone or tablet, being comfortable speaking and reading in English, and residing in the United States or U.S. territories.

Procedures

Participants were recruited nationwide through social networking websites and apps, as well as through local community-based organizations (CBOs), health centers, schools, and local events. Survey data were collected using a combination of self- and interviewer-administered approaches from participants at baseline, 3-, 6-, 9-, and 12-month follow-up. Fuller details on the methodology of the parent study can be found elsewhere.[21] Data analyzed herein were from the baseline visit.

All participants provided written informed assent or consent with a waiver of parental consent. The study was approved by the Institutional Review Board (IRB) of Columbia University, which served as the single IRB for the study.

Measures

Health care utilization was assessed based on the following question: "About how long has it been since you last visited a doctor for a routine checkup? A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition." Response options included (1) within the past year, (2) 1–2 years ago, (3) 3–5 years ago, and (4) >5 years ago. Responses were dichotomized such that those reporting routine checkups in the past year were coded as having past-year health care utilization. The 12-month timeframe was based on the long-standing recommendations of one well-child visit per year for adolescents.[22]

Predisposing variables included are theoretical anteced-ents of population health disparities that are often linked to differences in structural disadvantage. Parental education was defined by two variables: "How far did your mother (or the woman who raised you and who you thought of as your mother) get in school?" and "How far did your father (or the man who raised you and who you thought of as your father) get in school?" Responses for each parent in-cluded (1) did not finish high school, (2) graduated from high school or received a general education diploma (GED), (3) some college or technical training post-high school, (4) graduated from a 4-year college, and (5) earned an advanced graduate degree. Response category for both parents were summed and then dichotomized into lower ed-ucation and higher education based on a median (i.e., some college/technical training) split.

Participants who were missing education data for a parent or parents were coded as a separate category ("Incomplete Data") to avoid systematically excluding them from analy-ses. This allows us to nonjudgmentally account for a diver-sity of reasons why participants may have missing data on parental education.

Race/ethnicity was self-reported and divided into the fol-lowing six categories: non-Hispanic White; non-Hispanic Black; Hispanic; Mixed/Other; Asian; and American Indian, Alaska Native, Native Hawaiian, or other Pacific Islander. Age was categorized as 13–14, 15–16, and 17–18 to capture the nuances of increasing independence within the broad cat-egory of adolescence.[23] Internalized homonegativity was measured using the Internalized Homophobia Scale,[24] with very good internal consistency (Cronbach's $\alpha = 0.87$).

Enabling factors encompass the logistical aspects of obtaining care, included health literacy, type of health care facility utilized, and U.S. Census Division of residence. Health literacy was measured using a modified version of the Health Access Literacy subscale of the Youth Engage-ment with Health Services scale (Cronbach's $\alpha = 0.83$).[25] Having a primary care provider was dichotomized (yes/no) based on participant self-report of having one person they think of as their personal doctor or health care provider. Health care facility utilization asked participants to identify the facility where they most often receive their care, with an-swers dichotomized into (1) routine care facilities, which consisted of private clinic/CBOs, private doctors, or hospital clinics, and (2) urgent care facilities or no routine care, which consisted of emergency rooms, mobile health vans, county or school-based clinics, or no routine source of care.

Area of residence was divided into the nine U.S. Census Division definitions: New England (CT/MA/ME/NH/RI/VT), Middle Atlantic (NY/NJ/PA), East North Central (IL/IN/MI/OH/WI), West North Central (IA/KS/MN/MO/NE/ND/SD), South Atlantic (DE/DC/FL/GA/MD/NC/SC, VA/WV), East South Central (AL/KY/MS/TN), West South Central (AR/LA/OK/TX), Mountain (AZ/CO/ID/MT/NV/NM/UT/WY), and Pacific (AK/CA/HI/OR/WA). U.S. Census Divisions are con-sidered an enabling factor due to the impact that geographic location can have on the logistics of obtaining health care.

The only need factor included in the model was ever being tested for HIV (yes/no). HIV testing was classified as a need factor because it may signify self-perceptions of participants' health or health behaviors, including their relative HIV risk and need for related health care.

Data analysis

Factors with significant association at $p < 0.05$ with our outcome in bivariate analyses were retained for inclusion in a multivariable model. Three blocks of factors were se-quentially entered into a hierarchical logistic regression model. This allowed for statistical significance testing with each block of factors (predisposing, enabling, and need) as well as individual factors within these blocks. All statistical analyses were performed using IBM SPSS version 27.[26] Of note, the proportion of respondents reporting a primary health care provider was included in the Demographic and Health Characteristics section for descriptive purposes.

Results

Demographic and health characteristics

Past-year health care utilization was reported by 75% ($n = 556$) of the overall sample ($n = 741$; Table 1); 72.6% reported having a primary health care provider. Care was most often received at private doctor's offices (29.1%), hospital-based clinics (23.9%), and CBOs (16.9%), whereas 30.1% reported using urgent care facilities or having no routine source of care. The median age was 16 (range: 13–18), and the largest proportion of participants resided in the Middle Atlantic U.S. Census Division (23.3%). Participants represented diverse racial/ethnic groups, with 31.8% self-identifying as Hispanic, 23.9% as non-Hispanic White, 14.6% non-Hispanic Black, 13% Mixed/Other race, 9.7% Asian, and 7% American Indian, Alaska Native, Native Hawaiian, or Other Pacific Islander.

Sociodemographic and behavioral characteristics are reported in Table 1. YMSM with higher than median parental education were significantly more likely to report past-year health care utilization (50.7% vs. 36.8%). Participants of Mixed/Other races were significantly less likely to report past-year health care utilization than White participants. Partic-ipants reporting health care utilization in the past year, com-pared with those who did not, also had a significantly higher average health literacy score (mean 2.41 vs. 2.75). Among those with past-year health care utilization, 26.6% reported re-lying on urgent care facilities (vs. 40.5% among YMSM with no past-year health care utilization), 15.3% lived in the Pacific U.S. Census Division (vs. 24.3%), and 36.3% reported ever testing for HIV (vs. 24.3%).

Factors associated with past-year health care utilization

Table 2 presents the unadjusted and adjusted odds ratios (AOR) of past-year health care utilization and the associated predisposing, enabling, and need factors examined. We re-port here results from the final model (Column 4) due to largely consistent associations across models. In multivariable models, the addition of each block of theoretical predictors demonstrated an increasingly complex picture of individual- and structural-level factors associated with past-year health care utilization.

Among predisposing factors, lower levels of parental edu-cation, compared with higher, were associated with lower odds of past-year health care utilization (AOR = 0.56; 95% confidence interval [CI]: 0.38–0.84). Mixed/Other race YMSM were less likely to report past-year health care utiliza-tion compared with White YMSM (AOR = 0.50; 95% CI: 0.28–0.91). Younger age was associated with higher odds of

TABLE 1. DEMOGRAPHIC AND BEHAVIORAL CHARACTERISTICS, OVERALL,
AND BY PAST-YEAR HEALTH CARE UTILIZATION, $N=741$

| | | Past-year health care utilization: | | |
	Overall, n (%)	Yes, n (%)	No, n (%)	p
Total		**556 (75.0)**	**185 (25.0)**	
Predisposing				
Parental education				**0.002**
Lower education	347 (46.8)	240 (43.2)	107 (57.8)	
Higher education	350 (47.2)	282 (50.7)	68 (36.8)	
Incomplete data[a]	44 (5.9)	34 (6.1)	10 (5.4)	
Race/ethnicity				**0.018**
White, non-Hispanic	177 (23.9)	139 (25.0)	38 (20.5)	
Black, non-Hispanic	108 (14.6)	80 (14.4)	28 (15.1)	
Hispanic	236 (31.8)	185 (33.3)	51 (27.6)	
Am Ind/Alaska Nat/Nat Haw/OPI	52 (7.0)	36 (6.5)	16 (8.6)	
Asian	72 (9.7)	57 (10.3)	15 (8.1)	
Mixed/other	96 (13.0)	59 (10.6)	37 (20.0)	
Age groups				0.353
13–14	103 (13.9)	81 (14.6)	22 (11.9)	
15–16	290 (39.2)	222 (39.9)	68 (36.8)	
17–18	348 (47.0)	253 (45.5)	95 (51.4)	
Internalized homonegativity				0.275
Mean (standard deviation)	15.72 (5.62)	15.85 (5.69)	15.33 (5.40)	
Enabling				
Health literacy score				**<0.001**
Mean (standard deviation)	2.67 (0.81)	2.75 (0.80)	2.41 (0.80)	
Primary care provider				**<0.001**
Yes	556 (72.6)	445 (80.0)	111 (20.0)	
Health care facility utilized[b]				**<0.001**
Urgent care facilities (ER/no regular source)	223 (30.1)	148 (26.6)	75 (40.5)	
U.S. Census Division of Residence[c]				**0.011**
New England	27 (3.6)	23 (4.1)	4 (2.2)	
Middle Atlantic	173 (23.3)	147 (26.4)	26 (14.1)	
East North Central	80 (10.8)	62 (11.2)	18 (9.7)	
West North Central	33 (4.5)	23 (4.1)	10 (5.4)	
South Atlantic	124 (16.7)	92 (16.5)	32 (17.3)	
East South Central	53 (7.2)	36 (6.5)	17 (9.2)	
West South Central	77 (10.4)	57 (10.3)	20 (10.8)	
Mountain	44 (5.9)	31 (5.6)	13 (7.0)	
Pacific	130 (17.5)	85 (15.3)	45 (24.3)	
Need				
Ever tested for HIV				**0.003**
Yes	247 (33.3)	202 (36.3)	45 (24.3)	

[a]Participants who were missing education data for a parent or parents were coded as a separate category (''Incomplete Data'') to avoid systematically excluding them from analyses. Lower education=up to a high school education; higher education=some college to an advanced graduate degree.

[b]Health care facility utilized (ER/van/no regular source) versus (private clinic/community-based organization/private doctor/hospital clinic).

[c]U.S. Census Division definitions: New England (CT, MA, ME, NH, RI, VT), Middle Atlantic (NY, NJ, PA), East North Central (IL, IN, MI, OH, WI), West North Central (IA, KS, MN, MO, NE, ND, SD), South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV), East South Central (AL, KY, MS, TN), West South Central (AR, LA, OK, TX), Mountain (AZ, CO, ID, MT, NV, NM, UT, WY), and Pacific (AK, CA, HI, OR, WA).

Am Ind=American Indian; Alaska Nat=Alaska Native; Nat Haw=Native Hawaiian; OPI=other Pacific Islander; ER=emergency room.
Bold p-values indicate significant associations.

past-year health care utilization among 13- to 14-year-olds (AOR=1.91, 95% CI: 1.07–3.43) and 15- to 16-year-olds (AOR=1.55; 95% CI: 1.04–2.30) compared with 17- to 18-year-olds; age was only a significant factor in the final model. Odds of past-year health care utilization increased with higher average scores of internalized homonegativity (AOR=1.04; 95% CI 1.01–1.08).

Among enabling factors, odds of past-year health care utilization increased with higher health literacy scores (AOR=1.71; 95% CI: 1.36–2.16). The use of urgent care facilities (e.g., emergency rooms) was associated with lower odds of past-year health care utilization compared with routine care facilities (AOR=0.60; 95% CI: 0.41–0.87). Compared with living in the Pacific U.S. Census Division, living in the Middle Atlantic (AOR=2.50; 95% CI: 1.40–4.50) and West South Central (AOR=2.08; 95% CI: 1.04–4.10) U.S. Census Divisions were each associated with a greater likelihood of past-year health care utilization.

TABLE 2. HIERARCHICAL LOGISTIC REGRESSION MODELS EXAMINING FACTORS ASSOCIATED
WITH PAST-YEAR HEALTH CARE UTILIZATION ($N = 741$)

| | | Multivariable AORs | | |
| | Bivariate OR | Predisposing variables | Plus enabling variables | Plus need variables |
Variable (referent category)	(1)	(2)	(3)	(4)
Block statistics		$\chi^2 = 27.89$	$\chi^2 = 81.93$	$\chi^2 = 86.70$
	OR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Predisposing				
Parental education (higher education)				
Lower education	**0.54 (0.38–0.77)**	**0.53 (0.37–0.78)**	**0.57 (0.39–0.85)**	**0.56 (0.38–0.84)**
Incomplete data[a]	0.82 (0.39–1.74)	0.79 (0.36–1.71)	1.04 (0.46–2.38)	0.98 (0.43–2.23)
Race/ethnicity (White, non-Hispanic)				
Black, non-Hispanic	0.78 (0.45–1.37)	0.92 (0.51–1.64)	0.85 (0.46–1.58)	0.81 (0.44–1.51)
Hispanic	0.99 (0.62–1.59)	1.30 (0.79–2.15)	1.28 (0.75–2.20)	1.23 (0.71–2.11)
Am Ind/Alaska Nat/Nat Haw/OPI	0.62 (0.31–1.23)	0.77 (0.38–1.57)	0.84 (0.40–1.77)	0.85 (0.40–1.82)
Asian	1.04 (0.53–2.04)	1.11 (0.56–2.20)	1.15 (0.56–2.38)	1.13 (0.54–2.33)
Mixed/other	**0.44 (0.25–0.75)**	**0.52 (0.30–0.92)**	**0.50 (0.28–0.91)**	**0.50 (0.28–0.91)**
Age (17–18)				
13–14	1.38 (0.82–2.34)	1.45 (0.84–2.50)	1.67 (0.95–2.95)	**1.91 (1.07–3.43)**
15–16	1.23 (0.86–1.76)	1.27 (0.88–1.84)	1.40 (0.95–2.06)	**1.55 (1.04–2.30)**
Internalized homonegativity	1.02 (0.99–1.05)	1.02 (0.99–1.05)	**1.04 (1.01–1.08)**	**1.04 (1.01–1.08)**
Enabling				
Health literacy score	**1.69 (1.37–2.08)**		**1.82 (1.45–2.28)**	**1.71 (1.36–2.16)**
Health care facility utilized[b] (routine care facilities)				
Urgent care facilities (ER/no regular source)	**0.53 (0.38–0.75)**		**0.60 (0.41–0.88)**	**0.60 (0.41–0.87)**
U.S. Census Division of Residence[c] (Pacific)				
New England	3.04 (0.99–9.35)		**3.50 (1.05–11.74)**	3.38 (1.00–11.49)
Middle Atlantic	**2.99 (1.72–5.20)**		**2.59 (1.44–4.63)**	**2.50 (1.40–4.50)**
East North Central	1.82 (0.96–3.45)		1.94 (0.98–3.82)	1.87 (0.94–3.71)
West North Central	1.22 (0.53–2.78)		1.52 (0.63–3.67)	1.46 (0.60–3.52)
South Atlantic	1.52 (0.89–2.61)		1.72 (0.96–3.11)	1.71 (0.94–3.09)
East South Central	1.12 (0.57–2.21)		1.19 (0.57–2.50)	1.13 (0.54–2.38)
West South Central	1.51 (0.81–2.82)		1.97 (1.00–3.89)	**2.08 (1.04–4.10)**
Mountain	1.26 (0.60–2.65)		1.21 (0.55–2.70)	1.21 (0.54–2.69)
Need				
Ever tested for HIV (no)				
Yes	**1.78 (1.22–2.59)**			**1.61 (1.04–2.48)**
Change in R^2		$R^2 = 0.06$	$R^2 = 0.16$	$R^2 = 0.16$

χ^2 = Model chi-square for each block of variables, all significant at $p < 0.001$. Nagelkerke R^2. Bolded estimates indicate significance at $p < 0.05$.

[a]Participants who were missing education data for a parent or parents were coded as a separate category ("Incomplete Data") to avoid systematically excluding them from analyses. Lower education = up to a high school education; higher education = some college to an advanced graduate degree.

[b]Health care facility utilized (ER/van/no regular source) versus (private clinic/community-based organization/private doctor/hospital clinic).

[c]U.S. Census Division definitions: New England (CT, MA, ME, NH, RI, VT), Middle Atlantic (NY, NJ, PA), East North Central (IL, IN, MI, OH, WI), West North Central (IA, KS, MN, MO, NE, ND, SD), South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV), East South Central (AL, KY, MS, TN), West South Central (AR, LA, OK, TX), Mountain (AZ, CO, ID, MT, NV, NM, UT, WY), and Pacific (AK, CA, HI, OR, WA).

AOR, adjusted odds ratios; OR, odds ratio.

For the need factor examined, YMSM who ever had an HIV test were more likely to report past-year health care utilization (AOR = 1.61; 95% CI: 1.04–2.48) compared with those who were never tested.

Discussion

This study, guided by Andersen's model, examined factors associated with past-year health care utilization among a na-tionwide online sample of YMSM. Overall, a large majority (75%) of our sample reported past-year health care utilization, although this proportion slightly lags behind contemporary rates of routine health care utilization among adolescents in the United States.[4] Findings indicate that predisposing factors, such as higher parental education, younger participant age group, and higher internalized homonegativity, were associated with a greater likelihood of past-year health care utilization. Among enabling factors, higher health literacy

scores and residing in the Middle Atlantic and West South Central U.S. Census Divisions were associated with greater odds of past-year health care utilization, whereas use of urgent care facilities (e.g., emergency room) was associated with lower odds of the same.

Parental education has been linked to health care utilization in a variety of populations,[27–29] including limited research among YMSM.[30] We examined parental education rather than participant education due to an interest in predisposing factors among youth and a focus on YMSM with roughly similar levels of educational attainment. We found that lower levels of parental education were associated with lower odds of past-year health care utilization among YMSM. Lower levels of parental education are one form of familial hardship that may act as a predisposing structural barrier to health care utilization among YMSM. Individual-focused and family-level interventions seeking to expand or improve upon health care utilization among YMSM may be optimally targeted toward families who have experienced hardships in educational attainment.[31,32] Policies are needed to ensure more equitable access to education, which can prove vital in interrupting the inheritance of population-level health disparities.[33,34]

Existing research shows that annual health care utilization dramatically decreases among young men starting at age 16.[5] Among YMSM, our results also suggest a drop-off in past-year health care utilization by age. YMSM aged 13–14 were nearly twice as likely to report past-year health care utilization compared with those aged 17–18, whereas those 15–16 were about 50% more likely. This trend is particularly worrisome among YMSM, a priority health disparity population in need of increased public health attention. Furthermore, YMSM may still face rejection and abandonment from their families as they navigate their sexual identities, which impacts, among other things, their likelihood of accessing routine preventive care.[18,35]

Some YMSM report difficulties accessing routine health care settings.[6,7] We found that reduced health care utilization among YMSM occurred in the context of structural factors, including geographic region of residence[36,37] and a reliance on urgent care settings, rather than routine care through a traditional health care setting. Yet, reducing these barriers may prove insufficient without increasing access to health care that is competent and affirming for YMSM. Concerningly, we found that increases in internalized homonegativity scores were associated with a *greater* likelihood of past-year health care utilization.[38] Enabling factors that act as structural barriers, including poor preparedness and training among primary care providers to address the specific health needs of YMSM[16,39] and resultant stigma-related negative experiences[18,20,40] may exacerbate health disparities among YMSM, including among those who access routine health care. For instance, anticipated stigma and concerns of being "outed" to parents by health care providers may lead YMSM to conceal their sexual identities and avoid discussing their sexual health with doctors.[18]

The full breadth of structural barriers requires further study, including whether and how structural (e.g., geographic barriers to affirming care) and proximal factors (e.g., anticipated stigma and internalized homonegativity) may overlap and work together to inhibit routine health care utilization among YMSM.[38] Still, structural interventions that increase access to high-quality culturally competent health care providers delivering sexual orientation affirming care may help routinize health care utilization among YMSM, thereby aiding in the reduction of pressing health disparities experienced by this group.

Lower levels of health literacy may also function as a barrier to routine health care utilization.[41] We found that the odds of past-year health care utilization increased roughly 70% for every one-unit increase in health literacy scores. Lower health literacy is associated with lower perceived self-efficacy and has been linked, although inconsistently, with the unintentional worsening of health outcomes.[41] The self-efficacy conferred by increased health literacy may prove a critical avenue of resilience against perceived or anticipated discrimination in health care settings,[42] including among YMSM. Interventions may build individual-level health literacy among YMSM while dismantling the multi-level barriers to competent and sensitive care for this multiple-disparity population.

Finally, ever receiving an HIV test, the need factor examined in this study, was linked to greater likelihood of past-year health care utilization. Reduced routine health care utilization among YMSM may occur alongside important health-related developmental shifts, including beginning sexual activity and coming out.[43] Importantly, over time, MSM may choose to fragment their sexual health care from their primary health care.[44] Interventions to increase health care utilization should build connection to competent care provision for YMSM while emphasizing sexual health as an important component of routine primary care.

Limitations

Interpretation of study results is subject to limitations. First, the high prevalence of health care utilization among the sample (75%) may limit our ability to detect significant associations between relevant factors and our outcome of interest, particularly among those without past-year health care utilization. Second, recruitment from LGBT community venues may bias the sample toward YMSM engaged in community activities and open about their sexual orientation, which may impact the generalizability of our findings.

Third, we did not examine health insurance status or whether YMSM had a primary care physician due to their correlation with the type of health care facility used, although both also function as barriers to routine health care utilization. Fourth, although some factors were noted as potential barriers, the breadth of socio-structural factors that inhibit health care utilization are beyond the scope of the original study or this analysis. Importantly, this study was not optimized to examine how discrimination in health care settings may function as a barrier to routine care. Finally, the reliance on self-reported health care utilization information, rather than medical records, may be subject to recall and other biases.

Conclusions

Despite limitations, this study leverages Andersen's model to highlight an array of factors that are associated with past-year health care utilization among YMSM. Intervention research can leverage the individual, social, and structural factors to help improve health care utilization

among this group. Holistic approaches to reduce barriers to health care utilization, including increasing health literacy and reducing stigma within health care settings, may prove vital in engaging priority health disparity groups such as YMSM, especially as they transition into adulthood. Efforts to optimize health care to help address and reduce health inequities among YMSM should remain a critical priority for improving population health.

Authors' Contributions

J.E.D. led the statistical analyses, writing of the article and tables, and edited and reviewed the final draft. S.S. led the writing of an early draft of this study, and edited and reviewed the final draft. S.H. conceived the project, assisted with statistical analyses, and edited and reviewed the final draft. All authors reviewed multiple drafts of the article, provided formative feedback, and reviewed and approved the final article before submission.

Disclaimer

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