ORIGINAL RESEARCH

Receipt of preventive counseling among reproductive-aged women in rural and urban communities

JS McCall-Hosenfeld, CS Weisman

Pennsyvania State University College of Medicine, Hershey, Pennsyvania, USA

A B S T R A C T

Introduction: Preventive health interventions often occur less frequently among rural women compared to urban women. Preventive counseling is an important feature of comprehensive preventive healthcare provision, but geographic disparities in the receipt of preventive counseling services have not been fully described. In this study the framework of the behavioral model of healthcare utilization was employed to investigate the association between rurality and receiving preventive counseling. It was hypothesized that demographic differences in rural and urban communities, as well as differential healthcare resources, explain rural–urban healthcare disparities in preventive counseling.
Methods: Data were collected by telephone survey during 2004–2005 for 2002 participants aged 18–45 years in the Central Pennsylvania Women's Health Study. Measures of preventive counseling were based on US Preventive Services Task Force recommendations as of 2004. Multivariable models assessed the independent contribution of rurality to the receipt of counseling for smoking, alcohol/drug use, birth control, nutrition, weight management, and physical activity. Rurality was assessed using Rural-Urban Communting Area Codes. All models controlled for variables that *predispose* individuals to use health services (age, race/ethnicity, educational level), variables that *enable* or impede healthcare access (having a usual healthcare provider, using an obstetrician-gynecologist, poverty, and continuous health insurance coverage) and *need*-based variables (health behaviors and indicators).
Results: In bivariate analysis, the rural population was older, had lower educational attainment, and was more likely to be White, non-Hispanic. Urban women tended to report seeing an obstetrician-gynecologist more frequently, and engaged more frequently in binge drinking/drug use. Preventive counseling was low among both rural and urban women, and ranged from 12% of the

population for alcohol/drug use counseling, to 37% for diet or nutrition counseling. The degree of rurality appeared to impact counseling, with women in small or isolated rural areas significantly less likely than urban women and women in large rural areas to receive counseling related to smoking, alcohol/drug use and birth control. Overall, rural women reported less counseling for alcohol/drug use, smoking, birth control, nutrition and physical activity. In multivariable analysis, rurality was independently associated with lack of preventive counseling for physical activity. However, adjusting for predisposing, enabling and need-based variables fully attenuated the effect of rurality in the remaining models. Younger age, higher educational attainment, and seeing any obstetrician-gynecologist were associated with receipt of counseling in several models.

Conclusions: Most women do not receive recommended preventive counseling. While rural women are less likely than urban women to receive counseling, rurality generally was not independently associated with receipt of counseling once demographics, access to health care, and health behaviors and indicators were controlled. This suggests that both demographic differences between rural and urban communities as well as aspects of healthcare access govern rural–urban healthcare disparities in preventive counseling. These results speak to important targets for reducing urban–rural healthcare disparities in receiving preventive counseling, improving the health literacy of the rural population, educating rural healthcare providers about the need for preventive counseling, and the expansion of access to obstetrician-gynecologists in rural communities.

Key words: counseling, educational status, health services accessibility, healthcare disparities, preventive health services, USA, women.

Introduction

Prior research has shown that residents of rural areas are less likely than those in urban areas to receive recommended clinical preventive services such as Pap smears, mammograms, and influenza vaccinations[1,2]. While it is often assumed that rural–urban disparities in healthcare utilization are explained by a lower availability of health services in rural areas, other attributes of rural populations, such as older age, higher poverty, lower educational attainment, and poorer insurance status[3,4], could be implicated in rural–urban disparities. To date, most studies of rural–urban healthcare disparities have focused on screening tests or vaccinations and have not incorporated recommended preventive counseling services[1,5,6]. Studies that have examined rural–urban differences in counseling do not adjust for sociodemographic factors that differentiate rural and urban populations[7].

This article extends prior work by addressing receipt of recommended preventive counseling among reproductive-age women in a geographically diverse region. Using the framework of the behavioral model of health services utilization[8], rural–urban differences and the factors that might account for them were analyzed. It was hypothesized that receipt of preventive counseling would be less prevalent in rural areas but that these differences would be attenuated by other variables.

Methods

Population studied

Baseline data were examined from the Central Pennsylvania Women's Health Study's (CePAWHS's) random digit-dial telephone survey of 2002 women aged 18–45 years, conducted in 2004 and 2005. The design of this study has been described previously[9]. Briefly, CePAWHS was a population-based survey of reproductive aged women residing in Central Pennsylvania, USA. The target population encompassed 28 counties with oversampling of rural communities. Subjects were excluded for male gender, non-residence in the target region, or not speaking English or Spanish. Communities were prepared for the study by

advertisements in the local media. Selected households received a pre-notification letter containing a small ($2) incentive.

Each selected household was contacted up to 25 times to screen eligible participants. If there was more than one eligible participant per household, a single participant was randomly selected. Consistent with other random digit dial surveys, the *response rate* (number of complete interviews divided by the number of eligible reporting units in the sample) was 52% and the *cooperation rate* (proportion of all cases interviewed among all eligible units ever contacted) was 63%[10]. In comparison with census data, the sample was highly representative of the target population with respect to sociodemographics[9].

The Pennsylvania State University College of Medicine Institutional Review Board reviewed and approved the study and a Certificate of Confidentiality (CC-HD-04024) was obtained from the National Institutes of Health.

Dependent variables

The US Preventive Services Task Force (USPSTF) evidence-based recommendations for preventive counseling as of 2004 were used to identify dependent variables. Preventive counseling recommendations were selected that had either Level A or B evidence. Level A is good evidence that the service improves important health outcomes and benefits substantially outweigh harms; Level B is at least fair evidence that the service improves important health outcomes and benefits outweigh harms[11]. The following counseling recommendations were selected for investigation:

1. Screen and counsel all adults for tobacco use (level A, 2003).
2. Screen and counsel all adults for alcohol misuse (level B, 2004).
3. Provide periodic routine counseling about effective contraception for adults at risk of unintended pregnancy (level B, 1996).

4. Among obese patients, offer intensive counseling and behavioral interventions to promote sustained weight loss (level B, 2003).

Measures of receipt of these services were based on the question, 'In the past 12 months, has a doctor or other health professional asked you or talked to you about any of the following things?' The list that followed included smoking, alcohol or drug use, birth control, diet and nutrition, weight management, and physical activity.

Independent variables

Rurality was assessed using the zip-code based approximation of Rural-Urban Commuting Area (RUCA) codes, a classification taxonomy based on the sizes of cities and towns and daily commuting practices[12,13]. This taxonomy is particularly useful for studies of health service utilization because the communities into which individuals commute or flow may also be those in which they receive care[12]. A three-level classification was used that allows for comparison of rural versus urban areas by degree of rurality. In this classification system, urban areas are defined as metropolitan areas with primary commuting flows within an urbanized area of 50 000 individuals or greater; large rural city- or town-focused areas have primary commuting flow within an urban cluster of no more than 10 000 to 49 999 persons; small rural town-focused areas have primary commuting flow within an urban cluster of no more than 9999 persons; isolated small rural towns have primary commuting flow outside of an urban cluster[14]. Due to small numbers in the isolated rural category in the sample, small and isolated rural towns were combined. For ease of discussion, the three-category classification used in this study will be referred to as: urban, large rural area, and small or isolated rural area.

Independent variables were selected based on the behavioral model of health services utilization, which describes categories of factors that govern health services utilization: (i) variables that *predispose* individuals to use

services; (ii) variables that *enable* or impede access to care; and (iii) variables that govern the *need* for health services[8]. *Predisposing* factors included age, race/ethnicity, and education. To measure access to healthcare, an *enabling* factor, respondents were asked whether they have a regular doctor or other healthcare provider. Additionally, because the receipt of preventive services is associated with seeing an obstetrician-gynecologist[15] and because counseling content may differ based on the training of the counseling provider[16], whether the patient saw an obstetrician-gynecologist for any healthcare was also assessed. Financial access to health care was measured by poverty status and continuity of health insurance coverage in the past 12 months. Poverty status is based on household size and income; because over 10% of respondents did not report household income, they are coded as 'missing poverty' so that they may be compared with other respondents in analyses. Frequency of health services utilization was measured in the survey, but this variable was excluded from the models because it is redundant with the measured outcomes.

Need for preventive counseling is assumed because only services recommended by the USPSTF were identified for the target population. However, because the need for counseling is greater among individuals engaging in unhealthy behaviors, also included were measures of smoking status and whether or not the woman binge drinks (defined as 5 or more drinks on one occasion in the past month) or has used any illicit drugs in the past month. Obesity, which is specific indicator for need of counseling as defined by the USPSTF, was measured as a calculated body mass index (BMI) of greater than 30. Participant self-reported height and weight was used to calculate BMI.

Statistical analyses

Chi-square tests were used to perform bivariate comparisons of urban–rural differences on all study variables. Receipt of each counseling service was modeled using multiple logistic regression. All candidate variables were assessed for multicollinearity; no variables were excluded on this basis. All predisposing, enabling and need factors defined above were included as covariates in the models. Unhealthy behaviors and health indicators are included in appropriate models. All statistical analyses were performed using SAS v9.2 (SAS Institute; Cary, NC, USA).

Results

Sixty-one percent of the sample was classified as urban, 22% as residing in large rural areas, and 16% as residing in small or isolated rural areas. Associations between study variables and rurality are shown (Table 1). The rural population was older, had lower educational attainment, and was more likely to be White, non-Hispanic. Although rural and urban women were equally likely to identify a regular healthcare provider, urban women tended to report seeing an obstetrician-gynecologist more frequently. The only other statistically significant difference in independent variables was for binge drinking or drug use: urban women were more likely than rural women to engage in these behaviors.

Overall counseling rates ranged from 12% of the population for alcohol/drug use counseling, to 37% for diet or nutrition counseling. Women in small or isolated rural areas were significantly less likely than urban women and women in large rural areas to receive counseling related to smoking, alcohol/drug use and birth control. Rural women were also less likely to receive nutrition and physical activity counseling compared with urban women.

The results of the multivariable analyses are shown (Table 2). After controlling for demographics, healthcare access, and health behaviors and indicators, no independent association was found of rurality with counseling for smoking, alcohol/drug use, or birth control. However, residence in a large rural area significantly decreased the odds of receiving physical activity counseling compared with urban women. In multivariable models, younger age, higher educational attainment, and seeing any obstetrician-gynecologist were associated with increased odds of receiving several preventive counseling services. For

smoking counseling, the need for counseling (indicated by current smoking status) increased the odds of receiving counseling nine-fold. Similarly, obesity (which indicated need for counseling on diet or nutrition, weight management, and exercise or physical activity) substantially increased the odds of receiving these counseling interventions.

Discussion

The overall rates of receiving preventive counseling services were low for both urban and rural women, and rural women were less likely than urban women to report receiving five out of six preventive counseling services. In multivariable analysis, women residing in large rural areas were less likely than urban women to receive exercise counseling. However, rurality was not independently associated with receipt of preventive counseling for tobacco, alcohol/drug use, birth control, nutrition, or weight management. Other predictors of receiving counseling included *predisposing* factors (younger age, higher educational attainment), *enabling* factors (having continuous health insurance coverage and seeing an obstetrician-gynecologist), and *need* for counseling (smoking status, obesity). Thus these variables largely account for the effect of rural residence on receipt of counseling.

The finding that higher educational attainment was associated with increased odds of preventive counseling is consistent with prior research on receipt of preventive services[5,17] and counseling[15]. This finding may be explained in part by greater health literacy[18] or help-seeking among more highly educated women. Provider perceptions that preventive counseling is less relevant for some groups of women (eg older women) also may account for the findings. Due to pregnancy-related risks, all women of reproductive age should receive counseling related to tobacco use, alcohol/drug use, birth control, nutrition, and physical activity[19]. The findings suggest that providers may see these as issues only for younger women or women who engage in adverse health behaviors.

Seeing an obstetrician-gynecologist was independently predictive of increased counseling, and this may be highly relevant to women in rural areas where obstetrician-gynecologists are less available. Differential access to services provided by obstetrician-gynecologists in rural areas have prompted calls for increasing access to obstetrician-gynecologists as an important tool in reducing urban–rural healthcare disparities[20].

Comprehensive weight management counseling was less frequent for subjects in large rural areas than for urban women, independent of seeing an obstetrician-gynecologist, but the reasons for this cannot be discerned from this study. Further study of the predictors of counseling, including contextual factors describing women's communities, is needed to understand why some rural women do not receive preventive counseling.

Study limitations and strengths

This study has several limitations. First, data are self-report and thus may be subject to inaccurate recall of receipt of counseling. However, because patient counseling is not recorded in a standardized way, chart review cannot be used reliably to assess counseling behaviors; thus, self-report is the standard methodology for assessing preventive health counseling[21,22]. Moreover, although such factors as age, educational level, socioeconomic status, and social desirability could affect the reporting of preventing counseling[23], to the authors' knowledge these forms of recall bias are not known to differentially affect urban and rural populations.

Inaccurate recall of covariates may affect some of the effect estimates. For example, it is possible that participants' self-reported weights and heights were inaccurate, and that these inaccuracies would underestimate BMI by a small amount, resulting in a misclassification of true BMI categories[24]. However, self-reported height and weight have been found to accurately represent BMI abstracted from medical records for reproductive-age women[25]. Thus, it is unlikely that BMI misclassification affected the findings.

Table 1: Bivariate comparisons by degree of rurality - Central Pennsylvania Women's Health Study, 2004–2005

Variable	Locality *n* (%)			*P*-value
	Urban area	**Large rural area**	**Small or isolated rural area**	
Total[†]	1225 (61)	442 (22)	326 (16)	
Demographics (Predisposing)				
Age (years)				
18-24	201 (16)	53 (12)	38 (12)	0.004
25-34	457 (37)	144 (33)	132 (40)	
35-45	565 (46)	243 (55)	156 (48)	
White, non-Hispanic	1035 (85)	423 (96)	318 (98)	<.001
Greater than high school education	769 (63)	245 (55)	178 (55)	0.003
Healthcare access (Enabling)				
Regular healthcare provider	1079 (88)	398 (90)	299 (92)	0.121
Sees any OBGYN	861 (72)	286 (67)	216 (68)	0.058
Poverty status				
Poverty/near poverty	329 (27)	116 (26)	10 (34)	0.104
Not poverty	719 (59)	266 (60)	169 (52)	
Missing poverty	177 (14)	60 (14)	47 (14)	
Continuous health insurance coverage (12-months)	1013 (83)	366 (83)	255 (78)	0.141
Health behaviors and indicators (Need)				
Smokes	295 (24)	129 (29)	83 (25)	0.110
Binge drinking/drug use	211 (17)	58 (13)	37 (11)	0.010
Obesity	301 (25)	101 (23)	90 (28)	0.324
Preventive counseling services received				
Smoking	392 (32)	162 (37)	91 (28)	0.035
Alcohol/drug use	161 (13)	48 (11)	28 (9)	0.059
Birth control	441 (36)	141 (32)	93 (29)	0.025
Nutrition	489 (40)	143 (32)	112 (34)	0.009
Weight management	344 (28)	110 (25)	85 (26)	0.393
Physical activity	462 (38)	134 (30)	103 (32)	0.007

OBGYN, obstetrician-gynecologist.

†Rurality information was unavailable on nine women.

Another potential limitation of this analysis is that USPSTF guidelines are not specific about the frequency of recommended periodic counseling services. Participants were asked about counseling within the past year, but annual counseling is not necessarily recommended. Controlling for adverse health behaviors enabled us to partially address the timeliness of counseling. Additionally, participants reported that they had discussed these topics with their doctor in the past year, but discussing a topic with a doctor does not mean that appropriate counseling occurred; the content of the counseling was not measured in this study. Finally, although the sample is highly representative of the target population, the findings may not be representative of other regions.

An important strength of this work is its focus on rurality and the exploration of covariates that might explain rural–urban differences in counseling. These covariates have not been explicitly addressed in prior research. An additional strength of this work is its focus on clinical preventive counseling services that are evidence-based and recommended by the USPSTF.

Table 2: Predictors of Receiving Preventive Counseling - Central Pennsylvania Women's Health Study, 2004–2005

Predictor	Analysis	
	AOR	95% CI
Counseling for smoking or tobacco use (*n* = 1926)		
Demographics (Predisposing)		
Large Rural Area versus Urban Area	1.2	0.9–1.5
Small or Isolated Rural Area versus Urban Area	0.8	0.6–1.1
Ages 25-35 versus Ages 18-24	0.6*	0.4–0.8*
Ages 35-45 versus Ages 18-24	0.5*	0.4–0.7*
White, Non-Hispanic versus other	1.0	0.7–1.4
Greater than high school education versus less	1.3*	1.0–1.7*
Healthcare access (Enabling)		
Usual Source of Care versus none	1.0	0.7–1.4
Sees any OBGYN versus does not	1.4*	1.1–1.8*
Continuous health insurance coverage versus gap in health insurance in past 12 months	1.0	0.8–1.4
In/near poverty versus not in poverty	1.1	0.8–1.4
Missing poverty versus not in poverty	1.1	0.8–1.5
Health behaviors and indicators (Need)		
Smokes versus does not smoke	9.2*	7.2–11.8*
Counseling for alcohol or drug use (*n* = 1924)		
Demographics (Predisposing)		
Large Rural Area versus Urban Area	1.0	0.6–1.3
Small or Isolated Rural Area versus Urban Area	0.7	0.5–1.2
Ages 25-35 versus Ages 18-24	0.5*	0.4–0.8*
Ages 35-45 versus Ages 18-24	0.5*	0.4–0.8*
White, Non-Hispanic versus other	0.7	0.5–1.1
Greater than high school education versus less	1.7*	1.2–2.3*
Healthcare access (Enabling)		
Usual Source of Care versus none	0.7	0.5–1.1
Sees any OBGYN versus does not	1.8*	1.2–2.5*
Continuous health insurance coverage versus gap in health insurance in past 12 months	1.2	0.8–1.8
In/near poverty versus not in poverty	1.1	0.8–1.5
Missing poverty versus not in poverty	1.0	0.7–1.6
Health behaviors and indicators (Need)		
Binge drinking/drug use versus none	1.4	1.0–2.0
Counseling for birth control (*n* = 1,927)		
Demographics (Predisposing)		
Large Rural Area versus Urban Area	1.1	0.8–1.4
Small or Isolated Rural Area versus Urban Area	0.8	0.6–1.1
Ages 25-35 versus Ages 18-24	0.4*	0.3–0.6*
Ages 35-45 versus Ages 18-24	0.1*	0.1–0.2*
White, Non-Hispanic versus other	0.8	0.5–1.1
Greater than HS education versus less	1.8*	1.4–2.2*
Healthcare access (Enabling)		
Usual Source of Care versus none	0.8	0.6–1.2
Sees any OBGYN versus does not	2.3*	1.8–2.9*
Continuous health insurance coverage versus gap in health insurance in past 12 months	1.2	0.9–1.6
In/near poverty versus not in poverty	0.8	0.6–1.0
Missing poverty versus not in poverty	0.9	0.7–1.3

Table 2: cont'd

Predictor	Analysis	
	AOR	95% CI
Counseling for diet or nutrition (*n* = 1883)		
Demographics (Predisposing)		
Large Rural Area versus Urban Area	0.8	0.6–1.0
Small or Isolated Rural Area versus Urban Area	0.9	0.7–1.2
Ages 25-35 versus Ages 18-24	0.7*	0.5–0.9*
Ages 35-45 versus Ages 18-24	0.6*	0.4–0.8*
White, Non-Hispanic versus other	0.9	0.7–1.3
Greater than high school education versus less	1.7*	1.4–2.1*
Healthcare access (Enabling)		
Usual Source of Care versus none	1.0	0.7–1.4
Sees any OBGYN versus does not	1.5*	1.2–1.9*
Continuous health insurance coverage versus gap in health insurance in past 12 months	1.3*	1.0–1.8*
In/near poverty versus not in poverty	0.9	0.7–1.3
Missing poverty versus not in poverty	1.0	0.7–1.3
Health behaviors and indicators (Need)		
Obese versus not	3.7*	3.0–4.7*
Counseling for weight management (*n* = 1883)		
Demographics (Predisposing)		
Large Rural Area versus Urban Area	0.9	0.7–1.2
Small or Isolated Rural Area versus Urban Area	0.9	0.7–1.2
Ages 25-35 versus Ages 18-24	1.0	0.7–1.5
Ages 35-45 versus Ages 18-24	1.0	0.7–1.4
White, Non-Hispanic versus other	1.2	0.8–1.7
Greater than high school education versus less	1.4	1.1–1.8
Healthcare access (Enabling)		
Usual Source of Care versus none	1.5	1.0–2.2
Sees any OBGYN versus does not	1.4*	1.0–1.7*
Continuous health insurance coverage versus gap in health insurance in past 12 months	1.1	0.8–1.5
In/near poverty versus not in poverty	1.0	0.7–1.4
Missing poverty versus not in poverty	1.1	0.8–1.6
Health behaviors and indicators (Need)		
Obese versus not	6.1*	4.8–7.7*
Counseling for exercise or physical activity (*n* = 1883)		
Demographics (Predisposing)		
Large Rural Area versus Urban Area	0.7*	0.5–0.9*
Small or Isolated Rural Area versus Urban Area	0.8	0.6–1.1
Ages 25-35 versus Ages 18-24	0.9	0.6–1.2
Ages 35-45 versus Ages 18-24	1.0	0.7–1.4
White, Non-Hispanic versus other	1.0	0.7–1.4
Greater than high school education versus less	1.6*	1.3–2.0*
Healthcare access (Enabling)		
Usual Source of Care versus none	1.3	0.9–1.8
Sees any OBGYN versus does not	1.3*	1.0–1.6*
Continuous health insurance coverage versus gap in health insurance in past 12 months	1.2	0.9–1.7
In/Near Poverty versus not in poverty	0.9	0.6–1.3
Missing Poverty versus not in poverty	1.1	0.8–1.5
Health behaviors and indicators (Need)		
Obese versus not	2.8*	2.3–3.5*

AOR, adjusted odds ratio; CI, confidence interval; OBGYN, obstetrician-gynecologist.
*Statistically significant at the p<0.05 level.

Conclusions

Because rurality was generally not independently associated with receipt of counseling in multivariable models, the work indicates that other predisposing, enabling, and need factors account for counseling deficits in rural areas. Thus, public health efforts to reduce urban–rural healthcare disparities in preventive counseling should focus on increasing the health literacy of the reproductive-age rural population, educating providers about the need for preventive counseling, and expanding access to obstetrician-gynecologists in rural communities.

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