

ORIGINAL ARTICLE

Adolescents Report Their Need for and Use of Health Care Services

MELANIE J. ZIMMER-GEMBECK, M.S., TAMMY ALEXANDER, M.Ed., AND
ROBERT J. NYSTROM, M.A.

Purpose: The goals of this study were to describe student access to health care services, identify populations of students who remained in need of health care services, and highlight particular unmet needs for health care identified by these adolescents.

Methods: Students in Grades 9–12 attending 50 schools in Oregon completed the Youth Risk Behavior Surveillance Survey (YRBS). Questions requesting adolescents to report their need for specific types of health care, and access to general and specific types of care were added to the core YRBS. Multivariate logistic regression analysis was used to determine independent relationships between student or community characteristics and health care access or unmet needs for care.

Results: Almost 14,000 adolescents completed surveys, of whom 75% reported visiting one or more health care provider within the last 12 months. Nineteen percent of adolescents reported that they had not received 1 or more of 10 specific types of care when needed in the last year. Females, some racial/ethnic minorities, rural, and sexually active adolescents were more likely to report unmet needs for health care. Most frequently, adolescents reported they needed but did not receive care for an illness (7%) or for personal or emotional problems (6%). In addition, about 400 (3%) students reported they needed birth control that they did not receive.

Conclusions: A majority of high school-age adolescents had visited health care providers within the year prior to study. However, the number of adolescents who reported unmet specific health care needs within the

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KEY WORDS:

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Adolescents report that they are less healthy than they are perceived to be by their parents or physicians, and report a wide range of health concerns (1–2). These include school and interpersonal problems, acne, family planning, dental care, menstrual problems, mental health problems, sexually transmitted diseases, and pregnancy (2–7).

A decline in the health status of adolescents is expected over the next few decades, owing to the increasing poverty and fewer opportunities for adequate education and employment (2,5). Accordingly, more emphasis is now being placed on ensuring that this age group has sufficient access to continuing health care.

Emphasizing adequate health care for adolescents and evaluating these services has gained importance for at least two additional reasons. First, adolescence is considered an important time of transition when the development of social and cognitive skills are important to a quality adult life (2,8). The establishment of relationships with the health care system during this transitional time is important to provide necessary and timely support for healthy lifestyles and to provide interventions for those with unhealthy behaviors.

From the Multnomah County Health Department and Portland State University, Portland, Oregon (M.J.Z.); and Oregon Department of Human Services, Health Division, Portland, Oregon.

Address reprint requests to: Melanie Zimmer-Gembeck, Multnomah County Health Department, 2nd Floor, 426 SW Stark St., Portland, OR 97204.

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Second, the emphasis on adolescent health has been influenced by the recognition that the many factors affecting adolescent morbidity and mortality, such as violence, tobacco use, and unsafe sexual practices, could be prevented (2,9–11). The health care setting allows for their assessment, education, and intervention.

The goals of this study were to: (a) describe student access to general and specific health care services, (b) identify populations of students who reported unmet needs for health care services, and (c) highlight particular types of care that adolescents needed but did not obtain.

Methods

Data Collection

In the study reported here, questions regarding health care needs and access were added to the 1995 Youth Risk Behavior Surveillance Survey (YRBS) administered in Oregon. These questions, in combination with some of the core questions contained within the YRBS, were then used to assess group variations in health care needs and access. The core YRBS was developed by the Centers for Disease Control and Prevention (CDC) and was administered in over 40 states in 1995. Questions regarding health care needs and access are unique to the Oregon survey and provide estimates for a large sample of high school students.

The guidelines for administration of YRBS and the sampling procedures recommended by the CDC were followed as closely as possible (11). In addition, schools were allowed to participate as "volunteer" schools. Since only 43% of the 40 schools selected for the random sample chose to participate, volunteer schools were combined with these schools, resulting in a completely volunteer school sample. Randomly selected schools did not participate for reasons ranging from controversy over sexual activity questions in the YRBS to education budgets and time constraints. Schools were encouraged to either randomly select classes to participate or survey their entire school population.

Letters were prepared to notify parents of the survey. If a parent did not wish a child to participate in the survey, she or he was instructed to return the letter or contact the school. Students also had the option of not participating in the survey and could skip any questions they did not wish to answer. Approximately 2% of parents opted out of the survey and very few students chose not to participate.

The YRBS was administered by classroom teachers who used procedures designed to assure students' privacy and anonymity while taking the survey. Questions included in this study asked students to provide demographic information and answer questions regarding health behaviors and attitudes, as well as needs for and receipt of health care. The YRBS was approved by the Institutional Review Board of the Oregon State Health Division in 1992.

Survey Questions and Definitions

Demographics and community characteristics. Students reported their sex, age, grade, and race/ethnicity. In addition, students were assigned an indicator that identified characteristics of the community they lived in and schools they attended. The first indicator identified whether schools were in rural or urban settings. An urban setting was defined as the Portland, Salem, or Eugene city limits and suburbs. Rural students were those attending schools in other areas of the state. The second indicator was an assignment of socioeconomic status (SES) to all students within each school. The SES was a rank composite index developed by the Department of Education representing the geographic area surrounding a school. The index was based on the percentage of students eligible for free or reduced price lunch, student mobility rate, student attendance rate, and level of education of the most educated parent. Therefore, the SES assigned to participants represented characteristics of the general student population at their school. A rank of 1–59 was low, 60–119 was low-middle, 120–169 was upper-middle, and 170 or higher was upper SES. No data were available that could be used to compute individual SES scores.

Health care needs and history. Twelve questions were added to the core YRBS which asked adolescents to report their health care history and needs, including the timing of the last visit to a doctor/nurse practitioner (NP) or dentist.

The next 10 questions regarding health care had multiple parts. Students were asked to indicate their need and receipt of 10 types of care in the last year including: (a) checkups or sports physical, (b) injury or accident, (c) illness, (d) immunization (shots), (e) birth control/condoms, (f) sexually transmitted disease (STD), (g) pregnancy test, (h) "female" examination, (i) drug/alcohol problem, or (j) personal or emotional problem. For each of the 10 types of health care, adolescents were asked to check all that applied from the following list: (a) didn't need care; (b)

needed care, but didn't see anyone; (c) received care at a school-based health center (SBHC); (d) received care at a family doctor or community clinic; and (e) received care at an emergency room. Adolescents who selected (a) were classified as students who had not needed or received care, while those who selected (b) were considered students who had unmet needs for care. Selections of (c), (d), and/or (e) were combined to identify students who had received care. If no selections or inconsistent selections were made, these participants were not included in any analysis involving the particular survey item.

Analysis

Receipt of health care. After classifying students by demographic or community characteristics (student sex, grade level, age, race/ethnicity, SES, and whether the student attended a school in a rural or urban location), the timing of the last visit to a doctor/NP or dentist, and the proportions of students who reported not needing any of the 10 specific types of health care were described and compared using Pearson χ^2 . Only group differences that would be found by chance <1% of the time were discussed ($p < .01$). All analyses were weighted by school enrollment so that the weighted proportions of participating students by schools were equal to the proportions of total school enrollment each of the 50 schools represented.

Unmet needs for care. Independent relationships between demographic and community characteristics and the timing of the last visit to a doctor/NP or dentist were assessed using multiple logistic regression because of significant relationships between many demographic and community characteristics. Because age and grade level were highly correlated ($r = .87$), these variables were used interchangeably in separate models.

The dependent variables in these models were two dichotomous indicators of no recent visit for general health care. The first indicator identified students who had not received care from a doctor/NP within the last 2 years. The second indicator identified students who had not received dental care within the last 2 years. Therefore, each variable indicated no recent visit (defined as within the last 2 years) to a health care provider. The time period of 2 years was chosen to focus on adolescents who appeared to have no regular source of health care, to be comparable with other studies of health care access, and because the current recommendations for super-

visory visits suggested by the American Academy of Pediatricians for young people between 7 and 21 years of age is every 2 years (12–14).

Multiple logistic regression was also used to assess whether certain demographic or community characteristics were independently associated with an increased risk of not receiving one or more of the 10 types of health care when it was needed. In this analysis, the dependent variable indicated if a student needed one or more of the 10 types of care but did not receive that care. Finally, simple comparisons of the proportions of students who reported unmet needs for each type of health care in different demographic and community groups were completed using the Pearson χ^2 test. These were completed as a follow-up to the multivariate analyses to further describe the significant associations between student or community groups and unmet health care needs. Only group differences that would be found by chance <1% of the time were discussed.

Results

Participating Schools

A total of 50 high schools participated. Twenty-seven schools (54%) chose to survey their entire student population. Total school enrollment ranged from 40 to 1774 students. The proportions of students within schools participating in the survey ranged from 7% to 88%. Twenty-seven schools (54%) were classified as low or low-middle SES. Most schools ($n = 38$, 76%) were located in rural areas. The distribution of school size and SES of participating schools did not differ from the distribution in the total population of public schools in the state (15).

Fifteen of the schools (30%) had established SBHCs, and 32% of participating students had direct access to an SBHC. Of these students, 61% reported that they had used the SBHC in their school. Eight of the SBHCs could provide prescriptions for birth control, and five could dispense condoms on site.

Participating Students

Survey completion. A total of 14,891 surveys were returned, accounting for 80% of the students selected to participate. Most students who did not participate did so owing to absence from school. Nearly 10% of Oregon's 1995 public high school enrollment participated in the YRBS survey, and 44% of the total student enrollment in the 50 participating schools completed the survey. The distribution of gender,

grade, and race of the surveyed population did not differ from the total statewide public school enrollment (15).

Of the 14,891 completed surveys, 899 (6%) were excluded because of inaccurate survey responses (e.g., a student response of "yes" to a question about use of a nonexistent illegal drug) or because the survey contained 10 or more inconsistencies in related questions, out-of-range answers, and/or multiple answers. The remaining 13,992 surveys were included in the final data set.

Demographic characteristics. Participants were equally divided by gender (7039 females and 6953 males). Fifty-eight percent of participants were in the 9th or 10th grade. Most participants reported white race/ethnicity (81%). Although the percentages of students reporting minority status were small, the number of surveys completed were adequate for comparison purposes. For example, the smallest racial/ethnic group included 324 black students, representing 2% of participants.

Most students attended schools that were classified as upper-middle or upper SES (58%). Sixty-three percent of participants attended schools in rural areas. Students attending low-SES schools were more likely to also be living in rural areas, while the upper-SES schools were much more likely to be in urban areas ($\chi^2 = 3625.0$; $p < .0001$). Seventy-one percent of students in the low-SES classification were in rural areas, while more than two-thirds (67%) of students in the upper-SES classification were in urban areas.

There were also some differences in the racial/ethnic distribution of students after classification by SES and rural/urban setting. With the exception of Asian/Pacific Islander students, racial/ethnic minority students were more likely to reside in low-SES areas compared to white students ($\chi^2 = 791.7$; $p < .0001$). Asian/Pacific Islander students were fairly evenly distributed across all SES classifications. Black and Asian/Pacific Islander students were more likely to live in urban areas, while white, Hispanic, and Native American/Alaskan students were slightly more likely to live in rural areas ($\chi^2 = 789.2$; $p < .0001$).

Rates of risk and sexual behaviors reported by survey participants were generally lower than national rates compiled from the YRBS (11). For example, about 39% of students reported being sexually active, compared to 53% nationwide. In addition, 24% reported using tobacco in the 30 days prior to the survey (compared to 35% nationwide), 46% had

used alcohol in the last 30 days (52% nationwide), and 22% had used marijuana in the last 30 days (25% nationwide).

Visits for Health Care

Almost 80% of adolescents reported a visit with a doctor/NP in the last 12 months, and 76.2% reported visiting a dentist in that period of time (Table 1). A small percentage (7.1%) of high school students had never been to a doctor/NP, or their last visit was over 2 years ago, and 5.3% of adolescents surveyed had never received care from a dentist or had not seen one in the past 2 years.

Thirteen percent of students reported that they did not need (and did not receive) any of the 10 specific types of health care in the past 12 months. Males and students who were not sexually active were more likely to report that they had not needed or received any of the 10 types of health care assessed (Table 2). In addition, there were many differences in rates of specific types of care received in the last year when comparing students grouped by demographic and community characteristics.

Checkups, care for an injury, care for an illness, and immunizations. A higher proportion of male students compared to females received care for an injury or accident, and fewer males received care for an illness or immunizations. Care for checkups or sports physicals and immunizations decreased with age. Native-American/Alaskan, black, and white students were more likely to receive care for an illness than other students. Students of racial/ethnic minority status were more likely to be immunized compared to white students and students who reported "other" race/ethnicity. Sexually active students were less likely to receive a checkup or sports physical, but were more likely to receive care for an injury, accident, or illness. Rates of immunizations were higher for students attending lower-SES schools and students attending schools in urban areas. Finally, students attending schools with SBHCs were slightly less likely to have received care for a checkup or sports physical, but much more likely to have received immunizations.

Birth control and STDs. Females, older students, black students, and sexually active students were more likely to receive care for birth control and STDs. Native-American/Alaskan students reported higher rates of receipt of care for birth control, and a higher proportion of Asian/Pacific Islander students reported receiving care for STDs. In addition, students

Table 1. Adolescent reports of their last visits to a doctor/nurse practitioner (NP) and dentist

Group	Total n	Last Visit With a Doctor/NP (%)			Last Visit With a Dentist (%)		
		Within 12 mo	Within Past 1–2 yr	>2 yr ago	Within 12 mo	Within Past 1–2 yr	>2 yr ago
All students	13,992	79.7	13.2	7.1	76.2	18.5	5.3
Gender							
Females	7039	81.6	12.3	6.1	76.8	12.7	10.5
Males	6953	77.6	14.3	8.1	75.8	13.3	10.9
Age (yr)*							
≤14	1670	83.4	11.1	5.5	79.0	13.6	7.4
15	4072	80.2	13.3	6.5	77.0	11.9	11.1
16	3556	79.2	13.2	7.6	76.4	12.2	11.4
17	3131	77.8	14.4	7.8	74.6	14.9	10.5
18+	1563	79.1	13.9	7.0	74.9	13.1	12.0
Race/ethnicity							
Asian/Pacific Is	531	69.6	17.2	13.2	66.5	16.7	16.8
Black	324	79.6	11.8	8.6	69.6	19.1	11.3
Hispanic	669	71.7	15.7	12.6	57.4	18.6	24.0
Native-American/Alaskan	416	79.4	10.9	9.7	77.2	11.7	11.1
Other	527	79.6	14.7	5.7	73.8	12.8	13.4
White	11,381	80.6	13.1	6.3	78.4	12.2	9.4
School SES†							
Low	3196	78.6	12.2	9.2	69.9	16.0	14.1
Low-middle	2673	79.7	13.4	6.9	73.6	13.3	13.1
Upper-middle	2835	82.0	12.3	5.7	77.3	12.2	10.5
Upper	5288	79.1	14.6	6.3	81.7	11.1	7.2
School location							
Rural	8851	79.1	13.7	7.2	73.4	14.1	12.5
Urban	5141	80.4	12.8	6.8	80.2	11.5	8.3

Last visit with a doctor/NP, $n = 13,030$. Last visit with a dentist, $n = 13,369$ owing to missing values. Proportions were weighted by total school enrollment.

* Proportions by grade level were similar to proportions by age.

† SES score is a rank of a composite index created by the Department of Education, consisting of percentage of students eligible for free or reduced price lunch, student mobility rate, student attendance rate, and level of education of the most educated parent. A single SES score was assigned to all students within a school.

attending low- and low-middle-SES schools, students in urban areas, and students attending schools with SBHCs were more likely to receive both types of care in the past year.

Pregnancy tests and "female" examinations. Older students, black students, and sexually active students were more likely to receive care for pregnancy tests and "female" examinations. Higher rates of both types of care were reported by students attending low- and low-middle-SES school, schools in urban areas, and schools with SBHCs.

Drug/alcohol problems and personal/emotional problems. Males were just slightly more likely to have received care for drug or alcohol problems, while females were much more likely to have received care for personal or emotional problems. A higher proportion of older adolescents had received care for drug or alcohol problems, compared to younger adolescents. Asian/Pacific Islander and Hispanic

students were more likely to report care for alcohol or drug problems. More black students reported care for personal or emotional problems than other groups. Sexually active students and students attending low-SES schools were more likely to report receiving both types of care. Higher proportions of adolescents in urban areas and those attending schools with SBHCs received care for personal or emotional problems, compared to students in rural areas and students attending schools without SBHCs, respectively.

Lack of Access and Unmet Needs for Care

Visits to a doctor/NP. Student gender, race/ethnicity, school SES, and rural/urban school setting were all independent predictors of no recent visit to a doctor/NP (Table 3). Males were at increased risk compared to females. Asian/Pacific Islander, Hispanic, and Native-American/Alaskan students were at an increased risk of reporting no recent visit to a

Table 2. Weighted proportions of adolescents receiving specific types of health care, and group comparisons

Group	Type of Care Received (%)									
	Checkup or Sports Physical	Care for Injury or Accident	Care for Illness	Immunization (Shots)	Birth Control/Condoms	Sexually Transmitted Disease	Pregnancy Test [†]	"Female" Exam [†]	Drug/Alcohol Problem	Personal/Emotional Problem
All students	51	38	42	38	16	6			4	10
Gender										
Females	50	34	49	42	23	7	11	27	4	14
Males	51	41***	33***	34***	13***	5***			5*	7***
Age (yr)										
≤14	57	36	39	41	10	3	6	17	3	9
15	54	38	42	38	14	5	9	21	4	11
16	53	38	42	39	18	6	12	28	5	11
17	44	35	42	36	23	7	17	39	4	10
18+	41***	38	41	36*	27***	10***	25***	47***	6*	12
Race/ethnicity										
Asian/Pacific Islander	49	33	38	48	20	15	23	32	11	14
Black	55	40	42	43	39	14	30	49	8	16
Hispanic	47	33	32	46	23	9	16	27	10	13
Native American/Alaskan	52	39	44	44	27	9	19	38	5	13
Other	48	38	38	33	15	4	11	24	5	11
White	51	38	42***	37***	15***	5***	10***	27***	4***	10***
Sexually active										
Yes	48	40	45	38	38	11	26	51	7	14
No	52***	36***	40***	38	4***	3***	2***	12***	3***	8***
School SES [‡]										
Low	51	36	41	40	25	10	20	37	6	13
Low-middle	51	38	41	35	22	6	13	30	4	10
Upper-middle	50	38	42	36	12	4	8	25	3	9
Upper	50	37	42	38*	13***	5***	9***	23***	4***	10***
School location										
Rural	51	38	42	35	17	5	10	26	4	10
Urban	50	36	41	41***	20***	7***	15***	32***	5	12***
SBHC available										
Yes	48	37	42	43	22	8	17	34	5	12
No	52***	38	41	34***	15***	5***	9***	25***	4	10***

Asterisks are placed next to the last in a group of students who differed significantly when compared using Pearson χ^2 tests: * $p < .01$; ** $p < .001$; *** $p < .0001$. Proportions by grade level were similar to proportions by age.

SBHC = school-based health center; other = students of other or mixed race/ethnicity. $n = 13304$. Subgroup n ranges from 294 (black race/ethnicity) to 9481 (no SBHC available).

[†] Included females only.

[‡] SES score is a rank of a composite index created by the Department of Education, consisting of percentage of students eligible for free or reduced price lunch, student mobility rate, student attendance rate, and level of education of the most educated parent. A single SES score was assigned to all students within a school.

doctor/NP, compared to white students. For example, the odds of having no recent visit with a doctor/NP was almost 2.4 times higher in Asian/Pacific Islander students and almost 2 times higher in Hispanic students compared to white students independent of sex, age, SES, and rural/urban school setting. Black students and students who reported "other" race/ethnicity did not differ from whites.

Of all SES levels, only students attending low-SES schools had increased odds of no recent visit to a doctor/NP, compared to students attending upper-

SES schools. Students in rural areas also had an increased risk of no visit to a doctor/NP, compared to students in urban schools.

Visits to a dentist. Student age, race/ethnicity, SES, and rural/urban school setting were independently associated with adolescent reports of no recent dental visit (Table 3). Males did not differ from females. The risk of no recent dental visit increased with age. Asian/Pacific Islander high school students, Hispanic students, and students reporting "other" race/

Table 3. Results of multivariate logistic regressions examining independent associations between adolescent demographic characteristics, community characteristics, and no receipt of general health care in the past 2 years

Grouped by	No Visit to a Doctor/NP in the Past 2 Years*		No Visit to a Dentist in the Past 2 Years†	
	Adjusted Odds Ratio (Confidence Interval)‡	p Value	Adjusted Odds Ratio (Confidence Interval)‡	p Value
Gender				
Females	1.0		1.0	
Males	1.33 (1.16–1.53)	<.0001	1.03 (0.92–1.16)	.569
Age	1.06 (1.00–1.12)	.058	1.07 (1.02–1.12)	.003
Race/ethnicity				
Asian/Pacific Islander	2.38 (1.83–3.08)	<.0001	2.26 (1.80–2.85)	<.0001
Black	1.36 (0.96–1.93)	.079	1.32 (0.98–1.78)	.068
Hispanic	1.85 (1.41–2.44)	<.0001	2.62 (2.13–3.23)	<.0001
Native American/Alaskan	1.51 (1.05–2.17)	.027	1.04 (0.74–1.46)	.813
Other	0.88 (0.60–1.28)	.492	1.52 (1.17–1.96)	.001
White	1.0		1.0	
School SES§				
Low	1.35 (1.17–1.55)	.001	1.85 (1.59–2.15)	<.0001
Low-middle	0.99 (0.80–1.21)	.892	1.62 (1.37–1.92)	<.0001
Upper-middle	0.83 (0.67–1.02)	.083	1.27 (1.07–1.51)	.008
Upper	1.0		1.0	
School location				
Rural	1.31 (1.12–1.53)	.001	1.70 (1.48–1.94)	<.0001
Urban	1.0		1.0	

Grade level was not significantly related to no care from a doctor/NP or dentist, and was not reported. Analyses were weighted by total school enrollment.

* The dependent variable was an indicator of no care from a doctor or nurse practitioner in the past 2 years. A value of 1 indicated no care in the past 2 years, 0 care within the past 2 years. Whole model test: $\chi^2 = 114.7$; $p < .0001$. $n = 13,030$.

† The dependent variable was an indicator of no care from a dentist in the past 2 years. A value of 1 indicated no care in the past 2 years, 0 care within the last 2 years. Whole model test: $\chi^2 = 293.8$; $p < .0001$. $n = 13,369$.

‡ Odds of not seeing a provider in the past 2 years, compared to the group with an odds ratio of 1.0.

§ SES score is a rank of a composite index created by the Department of Education, consisting of percentage of students eligible for free or reduced price lunch, student mobility rate, student attendance rate, and level of education of the most educated parent. A single SES score was assigned to all students within a school.

ethnicity also had increased odds of no recent visit to a dentist, compared to white students. Black and Native-American/Alaskan students did not differ from white students.

Compared to upper-SES schools, the odds of no recent visit to a dentist were higher in lower-SES categories. Students attending low-SES schools had the highest risk of no recent visit to a dentist, followed by low-middle-SES and then upper-middle-SES schools. Finally, compared to urban students, those living in rural areas were also at increased risk.

Unmet needs for specific types of health care. Multivariate logistic regression revealed that the odds of reporting at least one unmet need for a specific type of health care in the year prior to the survey was elevated for males, students in lower grades, Asian/Pacific Islander students, Native-American/Alaskan students, sexually active students, and students attending schools in rural areas (Table 4). For example, sexually active students had almost two times the

risk of reporting an unmet need for health care, compared to students who were not sexually active. School SES was not related to reports of unmet needs for care after accounting for gender, grade level, race/ethnicity, school location, sexual activity, and access to an SBHC.

Group comparisons. Of all students, 18.9% reported they had needed at least 1 of the 10 specific types of health care in the last year but did not get that care (Table 5). Surprisingly, the most common type of care students reported needing but not receiving, was for an illness (6.5%), followed closely by care for a personal or emotional problem (6.3%).

Checkups, care for an injury, care for an illness, and immunizations. Hispanic students were most likely to report unmet needs for checkups or sports physicals and care for illnesses, compared to other students. Males, students in lower grades, Native-American/Alaskan students, Hispanic students, sexually active students, students attending schools

Table 4. Results of multivariate logistic regression examining independent associations between adolescent demographic characteristics, community characteristics, and an unmet need for one or more type of health care

Group	Unmet Need for One or More Types of Health Care*	
	Adjusted Odds Ratio (Confidence Interval) [†]	p Value
Gender		
Females	1.0	
Males	0.90 (0.82–0.99)	.030
Grade level (continuous)	0.92 (0.88–0.96)	.000
Race/ethnicity		
Asian/Pacific Islander	1.28 (1.03–1.59)	.029
Black	1.18 (0.92–1.50)	.187
Hispanic	1.22 (0.98–1.51)	.073
Native American/Alaskan	1.35 (1.05–1.75)	.021
Other	1.09 (0.87–1.37)	.458
White	1.0	
Sexually active		
Yes	1.92 (1.74–2.11)	<.0001
No	1.0	
School location		
Rural	1.16 (1.05–1.29)	.005
Urban	1.0	
SBHC available		
Yes	0.91 (0.83–1.01)	.086
No	1.0	

SES was not significantly related to an unmet need for health care, and student grade level had a much stronger association with unmet needs for health care than student age.

* The dependent variable was an indicator of an unmet need for 1 or more of the 10 specific types of health care. A value of 1 indicated an unmet need, 0 no unmet need. Whole model test: $\chi^2 = 222.1$; $p < .0001$. $n = 13,304$.

[†] Odds of having an unmet need for one or more type of health care compared to the group with an odds ratio of 1.0.

in rural areas, and students attending schools without SBHCs were more likely to report needing care for an injury or accident that they did not receive. Of all race/ethnicities, black students had the highest rate of unmet needs for immunizations, and sexually active students were more likely than other students to report needing immunizations that they did not receive. Sexually active students were also more likely to have reported unmet needs for checkups or sports physicals.

Birth control and STDs. As would be expected, a higher proportion of sexually active students reported not receiving care for birth control or condoms and care for STDs that they needed, compared to students who did not report being sexually active. Students attending schools without SBHCs had a higher rate of unmet needs for care for birth control

or condoms compared to students with access to SBHCs. Males and Native-American/Alaskan students were more likely to have reported unmet needs for care for STDs.

Pregnancy tests and gynecologic examinations. Among females, only sexually active students were more likely to have needed pregnancy tests or “female” examinations that were not obtained.

Drug/alcohol problems and personal/emotional problems. More males than females reported they had unmet needs for care of a personal or emotional problem. Native-American/Alaskan students and sexually active students were the most likely to report needing and not receiving both of these types of care. Students attending schools without SBHCs were more likely to report having unmet needs for drug/alcohol care.

Discussion

Visits for General Health Care and Care Received

This study found that more than three-quarters of adolescents had visited a health care provider in the past year. Consistent with past research (2,4,5), a higher proportion of females consulted health care providers than did males, and females were more likely to receive care for illnesses, birth control, STDs, and personal or emotional problems. Males were more likely to receive care for injuries or accidents and drug or alcohol problems. Sexually active students were more likely to receive all types of care except care for a checkup or sports physical. Rates of care related to sexual activity increased with age, and rates were higher in black students, students attending lower-SES schools, and students attending school in urban areas. Finally, schools with SBHCs had higher proportions of students who reported receiving care for immunizations, care related to sexual activity, and care for personal or emotional problems.

Unmet Needs for Care

There remained many students who had not visited a health care provider in the past 2 years and reported health care needs that were not met. Therefore, a substantial minority of adolescents appeared to have no regular source of health care, suggesting lower use of regular preventive services. Parent reports of their children’s health care have resulted

Table 5. Comparisons of weighted proportions of adolescents who reported unmet health care needs

Group	Needed One or More Type of Care but Did Not Receive	Type of Unmet Health Care Need (%)									
		Checkup or Sports Physical	Injury or Accident	Care for Illness	Immu- nization (Shots)	Birth Control/ Condoms	Sexually Transmitted Disease	Pregnancy Test [†]	"Female" Exam [†]	Drug/ Alcohol Problem	Personal/ Emotional Problem
All students	18.9	1.9	4.2	6.5	1.9	3.3	1.4			2.3	6.3
Gender											
Females	19.3	1.6	3.1	6.0	2.0	2.7	1.2	1.9	2.9	1.7	7.6
Males	17.5*	2.1	4.5***	6.9	1.9	3.2	1.7*			2.4*	4.6***
Grade level											
9	18.0	2.3	4.0	6.1	2.4	2.5	1.1	1.3	2.3	1.8	6.0
10	20.1	1.9	4.5	7.4	2.1	3.2	1.6	2.3	3.5	2.6	7.2
11	18.0	1.8	3.7	6.1	1.3	3.4	1.8	2.0	2.6	1.8	5.8
12	17.2	1.3	2.9*	6.1	1.7	2.9	1.4	1.1	3.5	1.9	5.3
Race/ethnicity											
Asian/Pacific Islander	19.1	4.1	1.7	8.0	2.0	3.5	1.5	0.4	3.2	1.4	5.1
Black	20.7	1.4	2.1	8.6	5.0	1.7	1.8	2.1	1.0	1.4	5.1
Hispanic	22.4	4.2	6.6	10.1	2.2	4.3	2.9	1.2	3.4	4.0	7.9
Native American/ Alaskan	25.7	2.3	9.6	8.2	2.0	3.9	3.7	3.3	2.4	4.4	9.2
Other	19.1	1.8	4.6	6.6	1.8	4.2	2.2	1.4	3.9	3.0	6.7
White	17.7**	1.6***	3.7***	6.0**	1.8***	2.8	1.2**	1.7	2.9	1.9**	6.0
Sexually active											
Yes	23.9	2.0	4.5	7.9	2.5	6.0	2.6	3.5	4.3	3.3	7.2
No	14.5***	1.7	3.3**	5.4***	1.4**	1.0***	0.5***	0.4***	2.0***	1.0***	5.4***
School location											
Rural	19.6	1.8	4.5	6.4	1.9	3.4	1.3	1.9	3.0	2.2	6.6
Urban	16.8***	2.0	3.0***	6.5	2.0	2.4*	1.6	1.3	2.9	1.8	5.5
SBHC available											
Yes	17.5	2.1	3.2	6.5	2.2	2.5	1.6	1.2	3.1	1.7	5.6
No	19.1	1.7	4.3**	6.4	1.7	3.3*	1.3	2.0	2.8	2.3*	6.5

Asterisks are placed next to the last in a group of students that differed significantly when compared using Pearson χ^2 tests: * $p < .01$; ** $p < .001$; *** $p < .0001$.

SBHC = school-based health center. Other = students of other or mixed race/ethnicity. $n = 13,304$. Subgroup n ranged from 294 (black race/ethnicity) to 9481 (no SBHC available). SES groups are not reported as there were no differences between groups.

[†] Included females only.

in similar estimates of the proportions of young people not receiving routine health care (13,16).

Adolescents who reported not seeking health care at all or who reported no recent care have been found to be less knowledgeable of the availability of health care services, to have less positive attitudes toward health care, and to be less likely to plan to seek care in the future (17). Therefore, a large number of high school students in Oregon may lack knowledge of health services, be developing negative attitudes toward health care, and be at risk for earlier and more severe health problems.

In this study, slightly more than 19% of students reported that they needed at least one type of health care but did not receive that care. It was also common for adolescents to report that health care needed

for personal or emotional problems went unmet (6%). Therefore, since only 10% of students reported they received care for personal or emotional problems, over one-third of all students who had needs for this care did not receive it. This finding is consistent with the report of Stiffman and colleagues (18) that less than one-quarter to one-half of adolescents with mental or social problems sought care.

Only a small minority of all high school students reported unmet needs for care for birth control (3%) or for drug or alcohol problems (2%) in the past year. Again, although the proportions of students reporting unmet needs may seem small, the proportions of students actually receiving care were also small. Therefore, a substantial proportion of high school students who reported needing these types of care

were still not accessing care, were finding care unavailable, or were being missed by the health care system. In addition, the proportion of participants who reported unmet needs for these services would represent about 4800 students statewide who had not received needed care for birth control/condoms and over 3350 students who had not received needed care for drug or alcohol problems in the year prior to the survey. This is a substantial number of young people who could be at risk for unplanned pregnancy, current or future STDs, and drug or alcohol problems, as well as a range of other negative health, behavioral, or psychosocial outcomes.

Variation in Visits for General Health Care, and Unmet Needs for Health Care

The risk of not having had a recent health care visit and reporting at least one unmet health care need was higher for some racial/ethnic minorities and students attending lower-SES and/or rural schools. Males were more likely to have had no recent visit to a doctor/NP and unmet health care needs. The proportions of students who reported at least one unmet need for health care decreased with increasing grade level, and sexually active students were more likely to report unmet needs for care compared to adolescents who were not sexually active.

Past research may provide insight into why these groups had lowered rates of health care visits. Hispanic young people and adolescents living in poverty or with lower incomes (especially incomes between \$5000 and \$15,000 annually) have been found to be most likely to have no health coverage (14,19). In addition, rural youth may have more problems with lack of transportation, availability of services, or concerns about confidentiality. Racial/ethnic minority adolescents may not seek services because of unavailability of sites of care that are culturally sensitive (6,19). Lack of insurance coverage or lower incomes have also been associated with decreased access to health care by adolescents and increased rates of poor or fair physical health (13,14,16). In addition, many of these groups of adolescents have been found to be at increased risk for unhealthy behaviors such as carrying weapons or using alcohol and drugs, and they have been found to have poorer health status (11,16,19). Accordingly, health care is less likely to be available to and accessed by the same adolescents who may have some of the greatest needs for comprehensive health care services.

This study found no differences between the proportions of black and white adolescents who had not

recently visited a health care provider or that reported at least one unmet need for health care, after adjusting for gender, age or grade level, school SES, and school location. A recent study of racial differences in health care usage found that black and Hispanic young people had more health needs and reduced access than white adolescents (16). In Oregon, few black youth live outside of metropolitan areas and public health care has been made more accessible owing to partially expanded coverage through the Oregon Health Plan (20) and public clinics established in accessible urban areas. Health care access of black young people may have been improved owing to this expansion of services. In contrast, Hispanic and Native-American adolescents more often live in rural areas where shortages of health care, especially public services, may exist.

In general, most groups of adolescents who reported receiving less care also reported more unmet needs for care. For example, compared to urban adolescents, lower proportions of rural young people received many types of health care and they also more frequently reported needing care that was not obtained. However, there were some exceptions. Most clearly, sexually active students were much more likely to receive almost all types of care compared to other students, and they were also at increased likelihood of reporting unmet needs for health care. Sexually active students seemed to be a group of adolescents who accessed some extra health care that they needed but were not finding, receiving, or attempting to access health care at other times when it was needed.

There are now more national and local adolescent health campaigns and programs which may be resulting in increased numbers of adolescents receiving the health care that they need, such as general health examinations, care for birth control/condoms, pregnancy tests, and gynecologic examinations (6,21,22). One fairly recent nationwide expansion of health care services is the establishment of SBHCs, and Oregon has been increasingly providing this service throughout the state. In the study presented here, the availability of an SBHC was associated with increases in the proportions of students reporting receiving six specific types of care, including care for birth control/condoms, care for STDs, pregnancy tests, gynecologic examinations, care for personal/emotional problems, and immunizations. Previous studies have also found that access to SBHCs is associated with increased receipt of health care for certain services (21-23). However, other studies have been mixed regarding the effects of SBHCs on health

status and risk behaviors (21,24–27). Investigating further whether the increased access to health care associated with the presence of SBHCs is improving health status and reducing adverse health behaviors should be one of the next steps toward an understanding of the current state of health care for older children, and will assist in assessing one aspect of the effectiveness of these programs.

Limitations

There are limitations of this study that must be considered. First, it was based upon adolescents' self-reports of their use of the health care system and their perceptions of their needs for care. It is possible that the adolescents' self-reported needs for care may not accurately reflect their actual needs. For example, adolescents may not yet recognize when they need and should seek out the health care system. They may neglect or downplay signs which would prompt adults or parents of younger children to go to a health care provider.

Second, this study provides no understanding of why adolescents did not get the care they reported they needed. Studies have found that many factors may influence adolescents willingness to seek or access health care, including lack of knowledge of service availability, parental factors, lack of finances or insurance, lack of transportation, concerns about confidentiality, poor motivation, fear of medical procedures, and affordability (6,14,16,28–31).

Third, only high school students and students attending class when the surveys were completed are included. High school dropouts, students more likely to skip classes, and other students who may be at highest risk were not included in this population. Therefore, these results may not adequately reflect their needs for and access to health care.

Fourth, the added questions were not pilot-tested prior to their inclusion in the YRBS. Some of the questions may have been difficult for all adolescents to interpret. For example, one question referred to "doctors or nurse practitioners." Another question referred to "sexually transmitted diseases." Not all adolescents may have had the knowledge of health and health care to answer these questions accurately. In addition, differences in cognitive developmental level among adolescents could influence both knowledge and conceptions of health and illness (8). It was not possible to understand how this may have affected the results. Therefore, these findings should be interpreted with caution until replicated.

In summary, this report highlights a segment of

Oregon adolescents (primarily males, some minority students, those attending lower-SES schools or rural schools, and sexually active students) who report unmet health care needs. In addition, access to two types of health care were most problematic for adolescents, including care for illnesses and care for personal or emotional problems. Overall, many young people may visit health care providers and get the health care they feel they need, but a substantial number of adolescents report that they have specific health care needs that are not being met. These results may provide some direction for SBHCs and other adolescent health care providers to increase their emphasis on reaching those adolescents who are sexually active or to target emotional and personal problems in educational or intervention programs.

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