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Diminished Trust of Healthcare Providers, Risky Lifestyle Behaviors, and Low Use of Health Services: A Descriptive Study of Rural Adolescents

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Abstract

The purpose of our study was to determine the extent to which individual characteristic variables predict trust of healthcare provider (HCP), lifestyle behaviors, and use of health services among adolescents attending public high school in rural Indiana. The sample included 224 individuals surveyed in 9th grade or 12th grade required courses. Trust of HCP and lifestyle behaviors were predicted using hierarchical multiple regression; number of HCP visits and emergency department (ED) visits in the past 12 months were predicted using negative binomial regression. This sample of adolescents living in a rural area reported riskier lifestyle behaviors than another sample of adolescents, lower trust of HCP than adults in general, and fewer HCP and ED visits than adolescents in general. Our study supports the need for school-based health services in rural areas and the opportunity for school nurses to act as care coordinators for marginalized youth.

Keywords

adolescent; health behavior; trust; health services; healthcare provider; high school; school nursing

Risk-taking behaviors contribute to the greatest causes of mortality and morbidity among American adolescents (Banspach et al., 2016). In addition, the rapid physical and cognitive changes of adolescence suggest young people likely need more healthcare services than they are receiving. The underutilization of health care by adolescents is likely due to many factors, one of which may be diminished trust of adults—including healthcare providers (HCPs)—that occurs as a part of normal brain maturation during adolescence (Chandler, 1987; Steinberg, 2010).

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Adolescents living in rural areas are more likely than urban and suburban adolescents to engage in some risk-taking behaviors (Keyes, Cerda, Brady, Havens, & Galea, 2014; Kim, Ozegovic, & Voaklander, 2012), to have less access to quality health services (Douthit, Kiv, Dwolatzky, & Biswas, 2015; Khoong, Gibbert, Garbutt, Sumner, & Brownson, 2014), and have lower rates of health services use (Gupta, Bhatnagar, & Bahugana, 2015; Khoong et al., 2014). This combination of factors may result in lifelong health consequences. The purpose of our study was to determine the extent to which individual characteristic variables predict trust of HCP, lifestyle behaviors, and use of health services among adolescents attending public high school in rural Indiana.

Health behavior is an individual's lifestyle practices that affect health, whether the effect is positive or negative (Gillis, 1997). Health behavior may have a health-promoting effect, while other behaviors—often termed risk-taking behaviors— may have a negative effect on health. As part of the developmental process, adolescents are known for adopting risk-taking behaviors (Steinberg, 2010), which are any activities that threaten the development, health, and well-being of the individual (Rew, Arheart, Thompson, & Johnson, 2013). Adolescents are more likely to engage in risk-taking behaviors because of neurologic development and associated cognitive changes, which lead to increased reward-seeking behavior during a time of diminished impulse control (Steinberg, 2010). Risk-taking plays a central role in normal adolescent development, creating the potential for self-discovery as well as vulnerability to negative consequences. Risk-taking can allow adolescents to test abilities, explore potential consequences, gain new skills, and gather new experiences, which in turn prepares the adolescent for future challenges. However, risk-taking can also lead to harmful outcomes with long-term consequences (Centers for Disease Control and Prevention, 2012). Common risk-taking behaviors associated with the leading causes of morbidity and mortality among adolescents and adults in the United States include (1) behaviors that result in unintentional injuries or violence; (2) tobacco, alcohol, and drug use; (3) unprotected sexual behaviors; (4) poor nutrition; and (5) physical inactivity (Centers for Disease Control and Prevention, 2012). Mortality rates triple between children in grade school and those aged 15–24 years because of adolescent risk-taking behaviors (DiClemente, Hansen, & Ponton, 2013).

Health-promoting behaviors are practices that have a positive effect on health. Pender, Murdaugh, and Parsons (2014) state that health-promoting behavior is associated with healthy lifestyle behaviors—patterns of daily activities that significantly affect health status in a positive way—and result in a high quality of life. While risk-taking behaviors are the largest threat of adolescent morbidity and mortality, research shows that health-promoting behaviors significantly influence resilience to risk-taking behaviors and stress (Rew, Arheart, Thompson, & Johnson, 2013).

A lack of trust of HCPs has been reported in studies among adolescents from diverse groups —both in the United States and internationally—when using health services (Ambresin, Bennett, Patton, Sanci, & Sawyer, 2013; Bahrami, Namnabati, Mokarian, Oujian, & Arbon, 2017; Blake, Robley, & Taylor, 2012; Coyne, Amory, Gibson, & Kieman, 2016; Kadivar et al., 2014; Majumder, O'Reilly, Karim, & Vostanis, 2015; Saftner, Martyn, & Momper, 2014). Adolescents who received health services for a chronic illness reported higher levels of trust of HCPs, which was attributed to the adolescents' faith in their parents' trust of

HCPs (Bahrami et al., 2017; Blake et al., 2012; Coyne et al., 2016). The difference in levels of trust of HCPs between adolescents who received preventative or acute health services (Kadivar et al., 2014; Saftner et al., 2014) and those that received chronic illness care (Bahrami et al., 2017; Blake et al., 2012; Coyne et al., 2016) appeared to be related to adolescents' interest in keeping knowledge of risk-taking behaviors concealed from parents.

In health care, trust has been demonstrated to influence many situations, including adolescent patients' willingness to seek health care (Saftner et al., 2014), to disclose sensitive information (Blake et al., 2012), and to submit to treatment (Majumder et al., 2015). Distrust of HCPs has been reported in several qualitative studies among adolescents from diverse groups—both in the United States and internationally (Bahrami et al., 2017; Majumder et al., 2015). While trust of HCP has not been measured among adolescents living in the rural United States, it seems likely that they would also report lower levels of trust of HCPs when receiving preventative and acute healthcare services. Additionally, accessing healthcare services in a rural area may pose considerable social barriers for adolescents—such as a perceived lack of confidentiality and anonymity in the health services setting—since many rural areas lack pediatric and adolescent specialists (Ray, Bogen, Bertolet, Forrest, & Mehrotra, 2014), resulting in adolescents and their family members all receiving treatment from the same provider and office staff. The blend of adolescent developmental stage, rural culture, and previous experience or lack of experience with health services may help to explain lower levels of health services use among adolescents living in rural areas (Douthit et al., 2015).

Research has shown that adolescents in general have low rates of both access to and use of health services (Alderman, Freeman, & Lobach, 2017). Contributors to low or inconsistent access to health services include lack of transportation, lack of health insurance, and out-of-pocket costs for services. Reasons for low use of preventative and acute health services include lack of parental support, along with issues related to confidentiality and minors' consent (Adelman et al., 2016). A lack of access to and use of health services, along with ambiguous legal status, compounds the problems of risk-taking behaviors among adolescents. Yet, trust of HCPs among adolescents living in rural areas and its effect on use of health services have remained virtually unexplored. Our study will add to the evidence regarding lifestyle behavior and health services use among American adolescents living in rural areas, while providing an initial quantitative measurement of trust of HCPs using a psychometrically sound instrument.

In our study, Andersen's Behavioral Model (ABM) of Health Services Use (Andersen, 2008) was used to identify concepts theoretically related to trust of HCPs, lifestyle behaviors, and use of health services among adolescents living in a rural area. The variables selected for the conceptual model for our study have been identified in the literature as having been significantly associated with adolescents' use of health services (Adelman et al., 2016). The research question that guided our study was which individual characteristic variables were predictive of lifestyle behaviors, trust of HCPs, and use of health services among adolescents attending a public high school in a rural area?

Method

Study Design

A cross-sectional, descriptive design was used to explore individual characteristics, trust of HCPs, lifestyle behaviors, and use of health services at a single point in time among adolescents living in a rural area. The University of Louisville Institutional Review Board (IRB 12.0290) and the administrators at the high school where the data were collected approved the study.

Setting

Our study was conducted at a public high school in a rural Indiana community. The Office of Rural Health Policy defines rural areas as incorporated populations of less than 50,000 with core census blocks of fewer than 1,000 people per square mile and surrounding census blocks with an overall density of fewer than 500 people per square mile (Health Resources and Services Administration, n.d.). This community had a population of approximately 6,000 individuals. The community in which our sample was drawn was a low-resource community, which is a community with limited financial assets, buildings, infrastructure, and population, where residents are more likely to experience poor health and suffer greater illness, disability, and premature death (Williams & Ronan, 2015). The school system had one full-time school nurse and one part-time school nurse serving kindergarten through Grade 12. All students in the sample had access to a school nurse, although the school nurses reported spending most of their time at the elementary school.

Sample

A convenience sample of adolescents between the ages of 14 and 19 years (Grades 9 and 12) were recruited from a public high school in rural Indiana during May 2014. Making use of 0.80 power and a moderate effect size, a minimum sample size of 123 participants was suggested (Cohen, 1988; Faul, Erdfelder, Buchner, & Lang, 2009). In order to obtain a sample reflective of the population and avoid selection bias, the sample was drawn from students enrolled in required courses with class time available for the survey. School administrators requested that all students in both Grades 9 and 12 be offered participation in the study so that teaching plans could be maintained across course sections. One week in advance of data collection, recruitment flyers were posted in the classrooms, study invitation letters were given to students, and passive consent letters for parents of minor students were distributed. Inclusion criteria were (1) age 14–19 years; (2) able to read, speak, and understand the English language; (3) able to complete a self-administered questionnaire; and (4) enrolled in Grade 9 or 12 at a public high school in a rural area. Exclusion criteria for our study were (1) adolescent unwilling to participate and (2) parent of minor refused consent. Potential participants included 316 students in Grades 9 and 12 at the public high school. During the days of data collection, 30 of the Grade 12 students had stopped attending class due to not meeting graduation standards, 54 students were absent, 5 students were taking a standardized exam, and 3 of the Grade 12 students declined participation. No parents refused consent. The final sample ($N = 224$) included participants in Grade 9 ($n = 128$) and Grade 12 ($n = 96$).

Procedures

Data were collected in a classroom setting at a public high school. Instructors were present to maintain order in the classroom, but they were advised to refrain from pacing around the room or positioning themselves in any way that would allow viewing participants' surveys. Paper-and-pencil format was used due to lack of functioning computer stations. Participants were encouraged to use a cover sheet during survey completion for the privacy of their responses. All participants completed a self-reported demographics questionnaire, which also included items concerning usual source of care, self-rated health, and diagnosed conditions.

Measures

Lifestyle behaviors were measured as a continuous variable using the Adolescent Lifestyle Questionnaire (ALQ). The ALQ is a 43-item, 5-point Likert-type scale made up of seven subscales (identity awareness, nutrition, physical participation, safety, social support, health awareness, and stress management) developed to measure determinants of a healthy lifestyle among adolescents (Gillis, 1997). The conceptual framework for the ALQ was based on Pender, Murdaugh, and Parsons' (2014) definition of a healthy lifestyle, which was "a multidimensional pattern of discretionary activities and perceptions that are a part of an adolescent's daily approach to living and that significantly affect health status in a positive manner" (Gillis, 1997, p. 31). In a sample of suburban-dwelling adolescents, the mean total score was 186.06 (SD = 27.56) (Rew, Wong, Torres, & Howell, 2007).

Trust of HCP was measured as a continuous variable using the Interpersonal Trust in Physician Scale (ITPS). In our study, trust of HCP was defined as a patient's accepted vulnerability to the HCP's possible but not expected ill will, made up of four overlapping domains: fidelity, competence, honesty, and global trust (Hall et al., 2002). The ITPS was developed to measure a patient's trust of the primary HCP. Although the name of this scale suggests it measures only trust in physicians, it was developed and tested for use with a variety of HCPs. The ITPS has 10 items scored on a 5-point Likert-type scale and has a seventh grade reading level. In a national sample of 959 adults with established primary care relationships (including HCPs other than physicians), the mean total score was 40.8 (SD = 6.2).

The Stanford Healthcare Use Questionnaire (HCUQ) is a 4-item questionnaire developed by the Stanford Patient Education Center for use in the Chronic Disease Self-Management Program (Ritter et al., 2001) to measure self-reported outpatient HCP visits, emergency department (ED) use, hospital inpatient stays, and number of inpatient days. Inpatient hospital stays/days were not measured in our study; therefore, only the two questions concerning outpatient HCP visits and ED use from this questionnaire were used. Use of health services was measured as the number of times the participant visited an HCP or the ED in a 12-month period. Reliability of the HCUQ has been assessed among adults using test–retest reliability (r = .76–.94; Ritter et al., 2001). Cognitive ability has the greatest known association with self-report validity. Reliability of self-reported health services use tends to better among young people as compared to older adults (Peersman, Pasteels, Cambier, De Maeseneer, & Willems, 2014), with older adults consistently under reporting

health services. Therefore, self-report of health services use among adolescents was used in this study.

Analysis

These data were analyzed using the SPSS Version 22.0 software package. Lifestyle behaviors and trust of HCP were predicted using hierarchical multiple regression. Due to non-normality of count data, number of HCP visits and ED visits were transformed into dichotomous variables indicating use or nonuse of the HCP and ED in the hierarchical multiple regressions for lifestyle behaviors and trust of HCP. To predict number of HCP and ED visits in the past year, negative binomial regression was used. Negative binomial regression is a generalized linear model used to predict overdispersed count data—meaning that many participants reported zero HCP or ED visits—and reports results as rate ratios (RR; Tabachnick & Fidell, 2014).

Results

The study sample ($N = 224$) was mostly White and reported a high rate of HCP-diagnosed conditions. The most frequently reported diagnosed conditions were allergies, overweight/obesity, asthma, depression, and attention deficit hyperactivity disorder (ADHD), which are shown in Table 1. Trust of HCP was measured by the total scale score of the ITPS, lifestyle behaviors were measured by the total ALQ Scale score, and the number of HCP and ED visits were self-reported counts in the past 12 months. Descriptive statistics for these central study variables are presented in Table 2. Frequencies of HCP visits and ED use are presented in Table 3, while reliability statistics for the ITPS and ALQ are presented in Table 4. Females had greater use of HCP visits, $M = 3.71$, $SD = 5.71$; $t(207) = -2.62$, $p < .01$, as compared to males ($M = 2.62$, $SD = 3.28$), but there were no significant differences in HCP visits by age. There were no differences in ED use by age or sex.

Trust of HCP

A hierarchical multiple regression was calculated to predict trust of HCP based on individual characteristics. A significant regression equation was found, $F(16, 160) = 2.96$, $p < .001$, and explained 25% of the variance in trust of HCP (see Table 5). The four predictor variables of trust of HCP were usual source of care (USOC), health insurance, lifestyle behavior, and transportation difficulty. Participants having an HCP as a USOC had higher levels of trust of HCP compared to those that did not have an HCP as the USOC; those individuals with Medicaid insurance had lower levels of trust compared to those with private health insurance, adolescents reporting higher levels of healthy lifestyle behavior also reported higher levels of trust of HCP, and those participants reporting transportation difficulty had lower levels of trust of HCP as compared to those reporting no transportation difficulty.

Lifestyle Behaviors

A hierarchical multiple regression was calculated to predict lifestyle behaviors based on individual characteristics. A significant regression equation was found, $F(16, 161) = 4.97$, $p < .001$, and explained 35% of the variance in lifestyle behaviors (see Table 5). The four significant predictor variables were self-rated health, age, trust of HCP, and sex. Participants

reporting excellent or very good self-rated health as compared to good, fair, or poor self-rated health had healthier lifestyle behaviors; younger participants had healthier lifestyle behaviors as compared to older participants; higher levels of trust of HCP compared to lower levels of trust of HCP predicted healthier lifestyle behaviors; and females had healthier lifestyle behaviors compared to males.

HCP Visits

A negative binomial regression was calculated to predict HCP visits based on individual characteristics. Six variables remained significant predictors of HCP visits after controlling for the influence of all other variables (see Table 6): sex, household income, self-rated health, self-perceived need, health insurance, and number of ED visits. The RR were calculated for the following variables: (1) males—compared to females—were less likely to have an HCP visit, (2) those living in a low-income household—compared to those living in a high-income household—were less likely to have an HCP visit, (3) those reporting poor self-rated health—compared to excellent, very good, good, or fair self-rated health—were less likely to have an HCP visit, (4) those reporting no self-perceived need were half as likely to have an HCP visit, (5) those without health insurance—compared to having Medicaid, military insurance, or private/other health insurance—were a third as likely to have at least one HCP visit, and (6) for each ED visit, HCP visits increased.

ED Visits

A negative binomial regression was calculated to predict ED visits based on individual characteristics. Two variables remained significant predictors of ED visits after controlling for the influence of all other variables (see Table 6): household income and number of HCP visits. The RR were calculated for the following variables: (1) those living in low-income household—compared to higher income households—were 3 times more likely to have an ED visit and (2) for each HCP visit, ED visits increased.

Discussion

To our knowledge, this was the first study to measure trust of HCP among adolescents in general using a valid and reliable instrument. In our study, use of the ITPS allowed a quantitative measurement of trust of HCP that can be compared to other studies. Adolescents become more skeptical of others around age 14 due to developmental brain changes (Steinberg, 2010); therefore, it is expected that adolescents would demonstrate lower levels of trust of HCP than adults in general. With this sample, the mean trust of HCP score (M = 38.7) was lower than found with Hall, et al.'s (2002) national sample of diverse American adults not defined by residential area (M = 40.8), but higher than found in Horn, Mitchell, Wang, Joseph, and Wissow's (2012) sample of low-income African American parents of young children (M = 36.5, SD = 3.4).

The most significant positive predictor of trust of HCP was having an HCP as the USOC. Having an HCP as the USOC reflects continuity of care and an opportunity to develop a relationship with an HCP. Trust of HCP has been shown to develop as a result of continuity with an HCP among both adults (Horn, Mitchell, Wang, Joseph, & Wissow, 2012) and

adolescents (Bahrami et al., 2017; Coyne et al., 2016). Another significant predictor of trust of HCP was having Medicaid health insurance. The relationship between Medicaid and trust of HCP may be related to household income and lack of choice in HCP. Medicaid typically has limited HCP provider choices for the purpose of cost containment. A study measuring trust of physician among low-income individuals indicated that they were more likely to perceive being discriminated against and have lower trust of physicians (Horn et al., 2012). Another study has also found a significant relationship between patients' choice and trust of HCP (Ward, Coffey, & Meyer, 2015). Without choice of HCP, individuals likely feel trapped in the relationship with the HCP.

Transportation difficulty also predicted trust of HCP among this sample of rural dwelling adolescents. Another study has also reported a relationship between transportation difficulty and lower levels of trust of HCP (Shoff & Yang, 2012). Individuals with transportation difficulty tend to be marginalized, and marginalized populations often demonstrate lower levels of trust of HCP.

The participants in our study reported risky lifestyle behaviors. Lower total ALQ scores suggest riskier lifestyle behavior. In our study, the mean total ALQ score was 156.54 (SD = 24.32), which was lower—indicating riskier lifestyle behaviors—than found among Rew, Wong, Torres, and Howell's (2007) study of a diverse group (N = 28) of late adolescents ages 18–21 at a university in the American Southwest (M = 186.06, SD = 27.56). A significant negative relationship was demonstrated in our study between age and lifestyle behavior, suggesting that older age is associated with riskier lifestyle behavior. Overall, the middle to late adolescents in our study reported riskier lifestyle behaviors than the late adolescents living in the American Southwest (Rew et al., 2007). Our results, in combination with previous ALQ measurements (Rew et al., 2007, 2013), suggest that lifestyle behaviors may be riskiest at approximately ages 17–19. These results are contrary to Steinberg's (2010) position that high-risk reward-seeking behavior associated with normal cognitive development peaks around age 15 and declines with further cognitive development that improves adolescents' self-regulation abilities. The riskiest lifestyle behaviors measured with this sample occurred around ages 17–19, which are likely related to the independence that accompanies driver's licensure and greater access to products that require legal adult status to purchase.

Trust of HCP was identified as a predictor of lifestyle behaviors. Other studies that have used the ALQ to measure lifestyle behaviors have found healthier lifestyle behaviors were predicted by other prosocial variables such as social connectedness (Rew et al., 2013) and religious commitment (Rew et al., 2007). Rew et al. (2007) suggest that adolescents with strong social bonds—such as those trusting their HCP—may also engage in healthy lifestyle behaviors because they feel a sense of responsibility to others and to following prosocial guidelines.

The relationship between healthy lifestyle behaviors and trust of HCP in our study was likely a combination of factors. As discussed previously, a number of studies have reported that adolescents distrust HCPs when accessing health services for risk behavior (Blake et al., 2012; Gupta et al., 2015; Kadivar et al., 2014). Risk behaviors were indirectly measured in

our study as the lower scores on the ALQ when assessing overall lifestyle behavior. A systematic review of 52 papers described having a USOC with a trusted HCP as a facilitator of healthy lifestyle behavior (Dennis et al., 2012). A combination of individual characteristics may result in healthier lifestyle behaviors among adolescents.

The adolescents in this sample demonstrated less use of health services when compared to national samples of adolescents not defined by residential area. According to a secondary analysis of the Medical Expenditure Survey by Berdahl, Friedman, McCormick, and Simpson (2013), adolescents aged 15–17 made nearly five HCP visits annually ($M = 4.6$) and 67% had at least one HCP visit in the past year. With this sample of rural-dwelling adolescents, the mean number of HCP visits in the past 12 months was 3.04 ($SD = 3.05$), with 81.3% of participants having had at least one HCP visit in the past 12 months. In our study, participants made 1.56 fewer HCP visits per adolescent annually than national figures. Although the proportion of adolescents making at least one HCP visit annually was similar, our study found fewer mean HCP visits than the most recent national data. People living in rural areas avoid the use of health services (Spleen, Lengerich, Camacho, & Vanderpool, 2014), and the sample in our study was consistent with this pattern. It seems unlikely that adolescents living in a rural area would have less need for HCP visits than urban or suburban dwelling adolescents—especially considering the high rates of HCP-diagnosed conditions reported by our sample. It is likely that the sample of adolescents in our study received informal means of healthcare information common among people living in rural areas (Lee & Winters, 2004; Long & Weinert, 1989), such as from a knowledgeable and trusted family member or friend or the Internet.

In our study, neither trust of HCP or lifestyle behaviors were a significant predictor of number of HCP visits. Previous research has shown that females tend to use more health services than males and that household income and health insurance predict the financial access to health services (Berdahl, Friedman, McCormick, & Simpson, 2013). Self-rated health and self-perceived need were subjective indicators of health, which also have known associations to health service use (Babitsch, Gohl, & von Lengerke, 2012). Number of ED visits was also a logical predictor of HCP visits because use of the ED suggests a serious health condition requiring ongoing treatment, and patients were likely instructed to follow up with their HCP after discharge from the ED.

Use of the ED tends to increase during adolescence due to risk-taking behaviors that result in unintentional injuries. According to a secondary analysis of the Medical Expenditure Survey, the mean number of ED visits per year for adolescents ages 15–17 was 1.2 and 11.6% of adolescents ages 15–17 used the ED at least once (Berdahl et al., 2013). In our study, the mean number of ED visits in the past 12 months was 0.79 ($SD = 1.39$), with 38.4% of participants having made at least one ED visit in the past 12 months. Our study found fewer mean ED visits in the past 12 months than the most recent national data, but a greater proportion using the ED at least once. Once again, these results support previous research that has reported rural residence as a risk factor for the avoidance of health services (Spleen et al., 2014).

In our study, low household income resulted in more than 3 times greater risk of using the ED. Lack of socioeconomic resources may result in care delayed until the health condition becomes urgent or unbearable (Babitsch et al., 2012). In addition, people living in rural areas are known to avoid health service use (Spleen et al., 2014), often resulting in urgent conditions that require more aggressive treatment than if it had been treated earlier in an outpatient setting (Johnson et al., 2012). As mentioned previously, the relationship between ED visits and HCP visits is logical. However, the small relationship (RR = 1.06) seen with this sample may not be clinically significant.

Limitations

Limitations in the research design and methods used in our study included a relatively small, nonrandom sample, cross-sectional study design, a homogenous group of research participants, self-report data, and the unknown influence of health policy changes related to the recent implementation of the Affordable Care Act. The ITPS has not been previously used with adolescents ages 14–19, although it has a seventh grade reading level, has been validated for use with individuals as young as 20 years old (Hall et al., 2002), and had good reliability in this sample ($\alpha = .90$). In addition, our study did not address informal sources of health information, which likely influence adolescents use of health services. Future research should address the influence of informal sources of health information and the effect of adolescents' trust of parents on lifestyle behaviors and health services use.

Implications for School Health Services and School Nursing

School nurses working with adolescents are in an excellent position to lead healthy lifestyle education programs and foster trusting healthcare relationships with adolescents. The results of our study demonstrate the need for school-based health services among adolescents attending rural high schools. Access to health services was shown to be a concern in this sample, with approximately one fifth of the sample without an HCP as a USOC and more than 12% reporting some level of transportation difficulty. For adolescents having difficulty accessing health services, the school nurse could serve to assess the adolescents' need for health services and to coordinate health services with local HCPs. It may be beneficial to expand the school nurse hours to include openings for adolescents to meet with the school nurse before or after school. Expanded school nurse availability would provide additional opportunities for adolescents to meet with the school nurse to have healthcare coordinated without interfering with the adolescents' education.

A school-based health clinic (SBHC) resolves many barriers to use of health services among adolescents (Mason-Jones et al., 2012). SBHCs provide comprehensive medical and mental health treatment for adolescents at their schools. SBHCs are designed to overcome barriers that inhibit young people from getting needed health care including lack of confidentiality or fear that confidentiality will not be maintained, transportation issues, fear that parents will be notified by the health insurer, inconvenient appointment times, costs, and anxiety about discussing personal health problems (Lofink, Juszczak, Trudnak, Koenig, & Fairbrother, 2015). While it may not be feasible for a small, rural school to support full-time staff for an SBHC, a mobile health clinic shared by several schools may be an appropriate solution. The mobile SBHC has been modeled in the Fresno County, CA, school district (Olson, 2016).

Since SBHCs are uncommon in rural areas, school nurses fill a critical need by evaluating adolescents' need for health services and coordinating access to those health services as necessary.

Conclusion

Our study examined individual characteristic variables among adolescents and determined the extent to which these variables influence trust of HCP, lifestyle behaviors, and use of health services among adolescents attending public high school in rural Indiana. Multiple significant associations were found between individual characteristics and the dependent variables of trust of HCP, lifestyle behaviors, the number of HCP visits used in the past 12 months, and the number of ED visits used in the past 12 months. Another important finding was that adolescents living in this rural area had a higher prevalence of asthma, overweight, and obesity, but lower rates of health service use than American adolescents did in general. Approximately 22% of American adolescents live in rural areas. With such a large portion of the adolescent population at risk for poor health outcomes, it is imperative that researchers, HCPs, and school nurses place greater attention on the health of rural-dwelling adolescents.

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Table 1

Demographic Characteristics.

Characteristic	*n* (%) or *M* (*SD*)
Age	16.4 (1.47)
Gender	
Male	100 (44.6%)
Female	121 (54.0%)
Missing	3 (1.3%)
Race/ethnicity	
White	210 (95.0%)
Native American	8 (3.6%)
Asian	7 (3.2%)
Black	5 (2.3%)
Hispanic	13 (5.8%)
Multiracial	7 (3.2%)
Missing	3 (1.3%)
Household income proxy	
NSLP participant	82 (36.6%)
Pays for lunch	140 (62.5%)
Missing	2 (0.9%)
Diagnosed conditions	
At least one diagnosis	136 (60.7%)
Allergies	88 (39.3%)
Overweight/obesity	37 (16.5%)
Asthma	35 (15.6%)
Depression	27 (12.1%)
ADHD	23 (10.3%)

Note. $N = 224$. Some participants reported multiple racial/ethnic groups. Totals and percentages reflect participant responses and therefore may not equal 100%. M = mean; SD = standard deviation; NSLP = National School Lunch Program; ADHD = attention deficit hyperactivity disorder.

Table 2

Descriptive Statistics for Outcome Variables.

Outcome Variable	*n*	Range	*M*	*SD*
Trust of HCP	211	17–50	38.68	7.5
Lifestyle behaviors	179	95–215	156.54	24.32
Number of HCP visits in past 12 months[a]	211	0–12	3.04	3.05
Number of ED visits in past 12 months[b]	218	0–8	0.79	1.39

Note. $N = 224$. Missing data contributed to differences in sample size for each variable. M = mean; SD = standard deviation; HCP = healthcare provider; ED = emergency department.

[a]Six outliers were removed from HCP visits.

[b]Five outliers were removed from ED visits.

Table 3

Health Behaviors in the Past 12 Months.

Health Behavior	*n* (%)
Any tobacco use	57 (25.7)
HCP visits[a]	
0 Visit	30 (13.4)
1 Visit	41 (18.3)
2 Visits	41 (18.3)
3 Visits	36 (16.1)
4 Visits	12 (5.4)
5 Visits	16 (7.1)
6 or > Visits	36 (16.9)
ED visits[b]	
0 Visit	131 (58.5)
1 Visit	42 (18.8)
2 Visits	22 (9.8)
3 Visits	12 (5.4)
4 Visits	8 (3.6)

Note. Missing data contributed to differences in sample size for each variable. HCP = healthcare provider; ED = emergency department.

[a]Six outliers were removed from HCP visits.

[b]Five outliers were removed from ED visits.

Table 4

Instrument Reliability.

Instrument	Variable Measured	Number of Items	*M*	*SD*	Cronbach's α
Interpersonal Trust in Physician Scale	Trust of HCP	10	38.70	7.50	.90
Adolescent Lifestyle Questionnaire	Lifestyle behaviors	43	156.54	24.32	.93

Note. *M* = mean; *SD* = standard deviation; HCP = healthcare provider.

Table 5

Hierarchical Multiple Regression Models for Trust of Healthcare Provider (HCP) and Lifestyle Behaviors.

Model	Trust of HCP	Lifestyle Behaviors
R^2	0.25	0.35
F for R^2 change	1.67**	10.58**
Age	—	−0.21**
Sex	—	0.15*
Trust of HCP	—	0.17*
Medicaid insurance	−0.26**	—
Transportation difficulty	−0.16*	—
Usual source of care	0.28**	—
Self-rated health	—	0.41**
Lifestyle behaviors	0.18*	—

Note. n = 161 for trust of HCP and lifestyle behaviors.

* $p < .05$.

** $p < .005$.

Table 6

Negative Binomial Regression Models for Number of Healthcare Provider (HCP) Visits and Emergency Department Visits in the Past 12 Months.

	HCP Visits			Emergency Department Visits		
		95% CI for Adjusted RR			95% CI for Adjusted RR	
Variable	**Adjusted RR**	**[Lower, Upper]**	***p***	**Adjusted RR**	**[Lower, Upper]**	***p***
Male gender	0.745	[0.552, 1.005]	.05	—	—	—
Low household income	0.579	[0.348, 0.962]	.04	3.300	[1.476, 7.377]	.004
No health insurance	0.307	[0.135, 0.699]	.005	—	—	—
Poor self-rated health	0.232	[0.108, 0.495]	<.001	—	—	—
No self-perceived health need	0.477	[0.317, 0.716]	<.001	—	—	—
Number of HCP visits	—	—	—	1.061	[1.020, 1.103]	.003
Number of ED visits	1.412	[1.204, 1.656]	<.001	—	—	—

Note. $n = 105$ for HCP visits, $n = 106$ for ED visits. CI = confidence interval; RR = rate ratio.