

Adolescent Reproductive Health Care: Views and Practices of Pediatric Hospitalists

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BACKGROUND AND OBJECTIVES: Many hospitalized adolescents are at increased risk for pregnancy complications due to an underlying medical condition, however sexual risk assessment is not consistently performed in this setting. While adolescents and their parents are supportive of sexual health discussion in the inpatient setting, a thorough understanding of factors that influence provision of this care among pediatric hospital physicians is lacking. This formative information is needed to facilitate efforts to improve and standardize clinical care provision. Our objective is to assess the frequency and factors that influence the provision of adolescent sexual and reproductive care by pediatric hospitalists.

METHODS: We performed a cross-sectional computerized survey of hospitalists at 5 pediatric hospitals who cared for ≥ 1 adolescent (14–21 years old) in the past year. Sexual and reproductive care practices were assessed by using a 76-item novel survey informed by the theory of planned behavior. We used descriptive statistics to summarize the data.

RESULTS: Sixty-eight pediatric hospitalists participated (49% response rate): 78% were women and 65% were aged <40 years. Most (69%) reported treating >46 adolescents annually, including many who are at an increased risk for pregnancy complications due to teratogenic medication use or a comorbid condition. A majority felt that sexual and reproductive services are appropriate, although many endorsed barriers, including concern about follow-up after emergency contraception (63%) and time constraints (53%). Most reported insufficient knowledge regarding contraception (59%), desired contraception education (57%), and were likely to increase contraceptive provision if provided education (63%). Hospitalists rarely provided condoms or referral for an intrauterine device.

CONCLUSIONS: Pediatric hospitalists frequently care for adolescents who are at risk for pregnancy complications and generally agree that reproductive care is appropriate in the inpatient setting. With these findings, we highlight the critical need for effective comprehensive reproductive health service interventions that are tailored to address the numerous actionable barriers identified in this study.

ABSTRACT



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By promoting healthy sexual and reproductive behaviors, pediatricians can play a critical role in ameliorating the deleterious impact of sexually transmitted infections (STIs) and unintended pregnancy on adolescent health.¹⁻⁴ Despite established guidelines to provide sexual and reproductive health care,^{1,5,6} pediatricians do not consistently provide this evidence-based care because of numerous barriers, such as time constraints, a lack of knowledge or comfort regarding contraception, confidentiality, and policies governing minor consent for care.⁷⁻¹¹ Furthermore, adolescents report barriers to sexual health, including privacy concerns, cost, and a lack of transportation.^{7,12} These multilevel barriers contribute to adverse health outcomes, as evidenced by high rates of STIs and unintended pregnancy in adolescents.^{2,3}

Access to care poses a major barrier for adolescents; hence, many forego preventive health visits and may have unmet needs when cared for within pediatric hospitals.^{12,13} Twenty-five percent of all children who are hospitalized in the United States are cared for in pediatric hospitals, including 80% of all children with chronic medical diagnoses. Furthermore, adolescents represent 18% of pediatric hospital discharges.¹⁴ Although many adolescents who are hospitalized are at an increased risk for pregnancy complications due to their underlying medical conditions or use of teratogenic medication, sexual risk assessment is not consistently performed in this setting.^{15,16} Although adolescents and their parents are supportive of sexual health discussions, STI testing, and pregnancy prevention education in the inpatient setting,¹⁷ a thorough understanding of factors that influence the provision of this care among pediatric hospital physicians is lacking. This formative information is needed to facilitate efforts to improve and standardize clinical care provision.

Health promotion programs are most effective when they are grounded in a theoretical framework in which the underlying factors influencing health behaviors are described.¹⁸ In the theory of planned behavior (TPB), it is posited that individuals' beliefs, subjective norms (eg, beliefs of important peers), and perceived

behavioral control (eg, barriers and facilitators of the behavior) combine to influence their intention to perform a specific behavior, which in turn influences whether they perform that behavior. This framework has been previously used to explore providers' provision of counseling for STIs and smoking cessation (Fig 1).¹⁹⁻²² In this study, we sought to develop a survey, informed by the TPB, to describe the factors influencing hospitalists' provision of adolescent sexual and reproductive care.

METHODS

Study Design and Population

We performed a cross-sectional study of hospitalists at 5 academic pediatric hospitals. Pediatric hospitalists treating ≥ 1 adolescent patient, aged 14 to 21 years, in the past year were eligible to participate. Physicians in training, such as residents and fellows, were excluded. Electronic survey invitations containing confidentiality and implied consent information were sent to hospitalists at participating institutions from August 2016 to April 2017. By responding to the survey, participants were providing their informed consent to participate in the study. Up to 3 reminder e-mails were sent at 1-week intervals to those who had not yet completed the survey. This study was approved by the institutional review boards at all participating institutions.

Survey Instrument

A multidisciplinary team that included physicians, psychologists, and nurse

practitioners with expertise in adolescent medicine, pediatric hospital medicine, health services research, public health, and preventive medicine developed the evidence-based survey, which was adapted from validated national surveys and relevant literature (Supplemental Fig 2).^{18,23}

Constructs from the TPB model were used to provide a conceptual framework for survey development. The survey instrument was pilot tested and optimized on the basis of feedback from 5 pediatric hospitalists who were not included in the study group. The survey contained no personal identifiers, and responses were not linked to participants. Study data were collected and managed by using Research Electronic Data Capture tools.²⁴

We created survey items according to the following TPB constructs: beliefs, subjective norms, perceived behavioral control (eg, barriers), practice intentions, and practice behaviors. To assess beliefs, participants reported "yes" or "no" for 10 items in which they were asked which reproductive health services they felt were appropriate to offer in their clinical settings (eg, counseling for sexual risk reduction and condoms). To assess subjective norms (eg, beliefs of important peers), participants reported "yes" or "no" for 10 items used to reveal if peer-developed clinical resources had an impact on their adolescent reproductive care practices (eg, informal guidelines and formal national guidelines). In addition, because our formative work revealed that providers' previous clinical experiences with adolescent

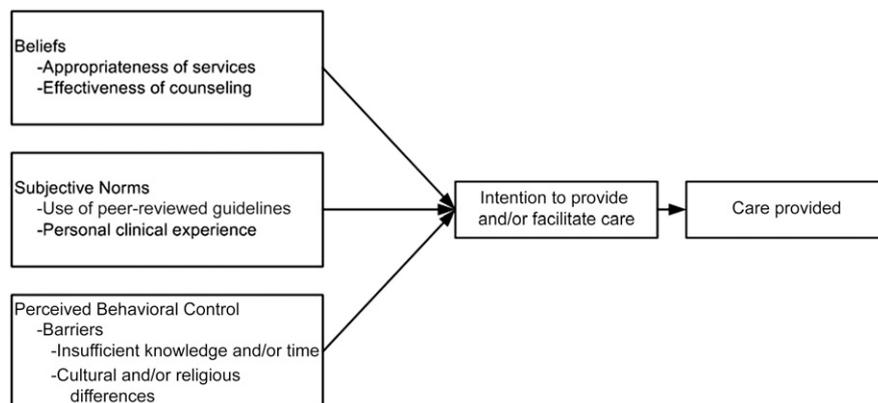


FIGURE 1 TPB schematic. Modified TPB is adapted to model the provision of sexual health care to adolescents.

reproductive care provision were important and often influenced by their peers, we created 2 items that were used to assess the influence of participants' personal clinical experiences in their care provision.

To assess the perceived behavioral control construct, we focused on barriers; participants responded to 20 items (eg, a lack of follow up, insufficient knowledge, and insufficient time) using a 5-point Likert scale ("strongly agree," "agree," "neutral," "disagree," or "strongly disagree"). To assess intentions to provide sexual and reproductive care, participants reported their intention to obtain a confidential sexual history in 7 clinical scenarios (eg, intentional ingestion, teratogenic medication prescription, and comorbid conditions) using a 5-point Likert scale ("extremely likely," "likely," "neutral," "unlikely," or "extremely unlikely"). To assess practice behaviors, participants reported their estimated frequency of obtaining a confidential sexual history using a 5-point Likert scale ("always," "very often," "sometimes," "rarely," or "never") and their estimated frequency (categorized as 0, 1–5, 6–10, 11–20, and >20) of providing specific reproductive services in the past year (eg, counseling for sexual risk reduction and condom provision). We also assessed interest in further education in certain reproductive services (eg, taking a sexual history and contraception) using a 5-point Likert scale ("extremely," "moderately," "somewhat," "slightly," or "not at all").

Participant Demographics

We assessed respondent demographics (eg, sex, age, clinical years in practice, and practice experience outside of hospital medicine) and hospital-level characteristics (eg, US region, number of beds, and hospital setting).

Statistical Analysis

We used descriptive statistics to report means \pm SDs for continuous variables and frequencies reported as percentages for categorical variables. Missing data were included in frequency calculations. All statistical tests were conducted by using SAS software version 9.4 (SAS Institute, Inc, Cary, NC).

TABLE 1 Participant and Hospital Characteristics (*N* = 68)

Characteristics	<i>n</i> (%)
Sex	
Female	53 (78)
Male	15 (22)
Age, y	
20–29	3 (4)
30–39	44 (65)
40–49	16 (24)
\geq 50	5 (8)
Years since completion of most advanced training	
<5	28 (41)
5–10	22 (32)
>11	18 (26)
Annual volume of patients \geq 14 y of age	
1–15	1 (2)
16–45	20 (29)
>46	47 (69)
Estimated adolescents prescribed teratogenic medications, ^a %	
<1	15 (22)
2–10	36 (53)
11–49	14 (21)
Estimated adolescents with a comorbid condition associated with pregnancy complication, ^a %	
<1	1 (1)
2–10	17 (25)
11–49	40 (59)
50–75	7 (10)
US region of practice ^b	
Pacific West	5 (7)
South Atlantic	3 (5)
West North Central	50 (74)
West South Central	10 (15)
Hospital size, No. beds	
25–49	3 (4)
200–299	26 (38)
300–399	39 (57)
Hospital setting	
Urban	65 (96)
Rural	3 (4)
Hospital type: academic and/or teaching	68 (100)
Majority owner of hospital	
No owners and/or nonprofit	60 (88)
Government-owned public hospital	3 (4)
Privately held and/or for profit	5 (7)

Missing data are included in percentage calculations.

^a Missing data: *n* = 3.

^b Pacific West (Alaska, Oregon, California, Hawaii, and Washington), South Atlantic (Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia), West North Central (Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota), and West South Central (Arkansas, Louisiana, Oklahoma, and Texas).

RESULTS

Sixty-eight participants (49% response rate) completed the survey (Table 1). Most were women (78%), had ≤ 10 years since their most advanced training (73%), had never practiced in a clinical setting outside of hospital medicine (72%), and reported treating ≥ 46 adolescents per year (69%). Of those who had clinical experience outside hospital medicine ($n = 18$), 67% reported practicing in outpatient general pediatrics, and 28% had experience in the emergency department and/or urgent care setting. Sixty-nine percent of participants reported that $>10\%$ of their adolescent population had comorbid conditions that could complicate pregnancy. Twenty-one percent of participants reported that $>10\%$ of their adolescent population used teratogenic medications.

Beliefs

Nearly all participants agreed that some services were appropriate to offer in the inpatient setting, including testing for HIV (93%) and *Neisseria gonorrhoeae* and/or *Chlamydia trachomatis* (CT) (92%), counseling for sexual risk reduction (90%), and referral for sexual and reproductive services (85%). There was less support for offering and/or distributing condoms (72%), referral for an intrauterine device (eg, Mirena; 66%) or implantable device (eg, Nexplanon; 66%), and prescribing the contraceptive pill, patch, or ring (63%) or Depo-Provera (medroxyprogesterone; 51%). Participants reported considering contraception discussion with a female adolescent with a history of previous pregnancy (84%) and obtaining a sexual history in adolescents who are at the highest risk for pregnancy complications (eg, those who are prescribed teratogenic medications or with serious comorbidities; 76%). Most (59%) agreed that preventive counseling is effective in reducing high-risk sexual behaviors.

Subjective Norms

The majority identified a national organization's guidelines (62%) as their preferred clinical resources for reproductive care provision. Additionally, 71% identified their own clinical experiences as an

TABLE 2 Barriers to Reproductive Care Provision ($N = 68$)

Barrier	<i>n</i> (%) ^a		
	Agree ^b	Neutral	Disagree ^c
Patient level			
Adolescents give inaccurate responses about sexual risk behaviors	33 (49)	13 (19)	19 (28)
Adolescents fear that parents will be notified about sexual health behaviors	31 (46)	14 (21)	20 (29)
Parents will be upset if pregnancy prevention is discussed with their adolescents ^d	9 (13)	14 (21)	44 (65)
Parents will be upset if requested to allow private discussion with their adolescents ^d	9 (13)	14 (21)	44 (65)
Provider level			
Lack of follow-up of adolescent patients who are prescribed emergency contraception ^d	43 (63)	9 (13)	15 (22)
Insufficient knowledge about contraception	40 (59)	9 (13)	16 (24)
Lack of sufficient time to personally provide care	36 (53)	12 (18)	17 (25)
Insufficient knowledge about reproductive health referral resources	30 (44)	8 (12)	27 (40)
Insufficient knowledge regarding pregnancy risk among adolescents identifying as lesbian, gay, bisexual, transgender, or questioning their sexual orientation	28 (41)	12 (18)	25 (37)
Lack of clinician interest in adolescent health issues	23 (34)	14 (21)	28 (41)
Side effects of hormonal contraception ^d	21 (31)	18 (26)	28 (41)
Religious beliefs of clinician	18 (26)	6 (9)	41 (60)
Clinician discomfort in obtaining a confidential sexual history	17 (25)	10 (15)	38 (56)
Insufficient knowledge of how to discuss sexual risk reduction	15 (22)	9 (13)	41 (60)
Insufficient knowledge of how to discuss pregnancy prevention	11 (16)	10 (15)	44 (65)
Liability regarding prescribing contraception to adolescents ^d	8 (12)	17 (25)	42 (62)
System level			
Lack of ancillary staff experience	32 (47)	12 (18)	21 (31)
Lack of adequate reimbursement for time spent counseling adolescents on pregnancy prevention	8 (12)	13 (19)	44 (65)
Resistance from ancillary staff to provide reproductive health services	8 (12)	19 (28)	38 (56)
Resistance from administration to provide reproductive health services	7 (10)	19 (28)	39 (57)
Multilevel^e			
Cultural differences between clinicians and patients	30 (44)	12 (18)	23 (34)
Sex differences between clinicians and patients	18 (26)	14 (21)	33 (49)

Missing data were included in calculations.

^a Unless otherwise noted, missing data: $n = 3$.

^b Those who reported agreement with the barrier statement: agree = "agree" or "strongly agree."

^c Those who reported disagreement with the barrier statement: disagree = "disagree" or "strongly disagree."

^d Missing data: $n = 1$.

^e Barriers that cross multiple levels (eg, provider and patient levels).

important influence on their care provision. Other resources included individual review of evidence-based literature (29%) and informal guidelines from peers or administrators (eg, institution clinical guidelines; 24%).

Participants identified their top 2 resources for sexual and reproductive care provision as the American Academy of Pediatrics (72%) and the Centers for Disease Control and Prevention (60%).

Perceived Behavior Control (Barriers)

Participants identified multiple barriers to care provision. Participants most commonly cited these barriers: concerns about follow-up after emergency contraception (63%), a lack of knowledge regarding contraception (59%), insufficient time to provide this care (53%), and insufficient knowledge regarding pregnancy risk among adolescents identifying as lesbian, gay, bisexual, transgender, or questioning their sexual orientation (41%). Participants also noted sociocultural barriers, including cultural differences between hospitalists and patients (44%) as well as the religious beliefs of clinicians (26%; Table 2).

Practice Intentions

In a hypothetical scenario, nearly all participants were “likely” and/or “extremely likely” to obtain a confidential sexual history for an adolescent girl who was admitted with abdominal pain (99%). Intention to

assess sexual health was less common when the scenario did not involve a complaint potentially related to the genitourinary system (Table 3).

Practice Behaviors

More than half of pediatric hospitalists (56%) reported a frequent assessment of sexual health. However, a majority of participants reported providing sexual risk–reduction counseling (61%), condoms (84%), or referral for an intrauterine device (87%) ≤ 5 times in the past year (Table 4).

Future Directions and Education

Participants were “moderately” and/or “extremely” interested in additional education regarding contraception (57%), adolescent consent and confidentiality (43%), and STI testing (40%). Most (63%) reported that they were likely to increase care provision if offered further education.

DISCUSSION

We used the TPB framework to describe the formative viewpoints of hospitalists that impact adolescent reproductive care provision in pediatric hospitals. Pediatric hospitalists care for many adolescents who are at an increased risk for pregnancy complications and are generally supportive of reproductive care provision. More than half of the participants frequently assessed

some aspects of sexual health, and a vast majority felt that many reproductive services are appropriate in their clinical settings, although there was more support for STI testing compared with contraception and pregnancy prevention services. Despite this general support, pediatric hospitalists report numerous barriers to care provision, and many do not report providing key aspects of care, such as providing sexual risk–reduction counseling, condoms, or referral for contraception.

Given the important, evidence-based national guidelines for adolescent contraception provision,^{6,25,26} we highlight the missed opportunities for pediatric hospitalists to better address adolescent reproductive health needs. A majority of pediatric hospitalists were likely to discuss reproductive care with high-risk adolescents, such as those with a past history of pregnancy or underlying psychiatric comorbidities, such as mental health disorders or substance abuse.^{27,28} However, more than one-third of hospitalists were unlikely to discuss sexual health with a female patient who was taking a teratogenic medication, and approximately one-half were unlikely to discuss sexual health with a female patient with an underlying medical condition that could lead to pregnancy complications (eg, diabetes). These findings reveal critical missed opportunities for care provision that contribute to poor sexual health outcomes among adolescents.

We identified numerous actionable barriers to care, including a lack of knowledge regarding contraception. Insufficient knowledge regarding contraceptive services can negatively impact providers’ abilities to provide counseling, guidance, and ultimately prescriptions for appropriate contraception for their adolescent patients.²⁹ Similar to the authors of a previous study in the pediatric emergency department,⁸ we found that concern regarding a lack of follow-up after emergency contraception prescription was the most frequently cited barrier despite evidence and guidelines revealing that no specific follow-up is needed after emergency contraception,³⁰ highlighting an additional opportunity for education.

TABLE 3 Intention to Perform Confidential Sexual Health Assessment by Clinical Scenario (*N* = 68)

Clinical Scenario	Likely to Assess Sexual Health, ^a <i>n</i> (%) ^b
16-y-old girl admitted for abdominal pain	67 (99)
14-y-old boy with moderate developmental delay admitted for asthma	9 (13)
16-y-old boy admitted for abscess and/or cellulitis	29 (43)
17-y-old girl with uncontrolled diabetes admitted to the ICU for diabetic ketoacidosis	39 (57)
15-y-old girl admitted for mild dehydration who takes topiramate for migraines	44 (65)
18-y-old male patient admitted for concussion who reports previous marijuana use	52 (76)
15-y-old girl admitted after intentional ingestion now at neurologic baseline	60 (88)

Missing data are included in percentage calculations.

^a Those who reported they were likely (“likely” or “extremely likely”) to assess sexual health in future clinical scenarios; otherwise, respondents reported they were unlikely (“unlikely,” “neutral,” or “extremely unlikely”) to assess sexual health in future clinical scenarios.

^b Missing data for all scenarios: *n* = 1.

TABLE 4 Current Practices: Provision of Specific Reproductive Health Services (*N* = 68)

No. Times Offered and/or Recommended in Past 12 mo	<i>n</i> (%) ^a
Sexual risk–reduction counseling	
0	8 (12)
1–5	33 (49)
6–10	11 (16)
11–20	5 (7)
>20	6 (9)
Condom provision	
0	47 (69)
1–5	10 (15)
6–10	1 (1)
11–20	1 (1)
>20	4 (6)
Testing for GC and/or CT	
0	5 (7)
1–5	25 (37)
6–10	17 (25)
11–20	9 (13)
>20	7 (10)
Referral for intrauterine or implantable device	
0	54 (79)
1–5	5 (7)
6–10	2 (3)
11–20	2 (3)

Missing data are included in percentage calculations. GC, *Neisseria gonorrhoeae*.

^a Missing data for all items: *n* = 5.

Furthermore, pediatric hospitalists reported reliance on their own clinical experiences as a primary resource for sexual and reproductive care. This represents an additional barrier to care provision because these hospitalists may not be up to date on current guidelines and may neglect to provide specific services.⁸ Hospitalists were likely to increase care provision if provided education; hence, this warrants further exploration.

Our study should be viewed in light of the following limitations. Our response rate was low at 49%, although it was similar to other studies of pediatric hospitalists.^{31,32} The study was performed in academic pediatric hospitals; therefore, our results may not be generalizable to other clinical settings. There is risk for selection bias because

voluntary participation may imply an inherent interest or knowledge regarding reproductive health. We were unable to compare characteristics between responders and nonresponders to further assess for bias. However, we were able to enroll a study population that represented multiple regions of the country with characteristics that were consistent with the majority of pediatric hospitalists practicing in the United States (eg, mostly women <40 years old).³³ Trainees were excluded from our study because of variability in their practice locations and clinical subspecialties; however, they may play a role in providing reproductive care to adolescents who are hospitalized. We did not investigate provider practice differences by adolescent subgroups (eg, younger versus older age), which may influence a provider's likelihood to assess sexual health and provide resources, although this has been described in past literature.^{9,11,15} We relied on participant self-report regarding past and intentional practice behaviors, which are susceptible to response and social desirability biases. It is possible that there are additional factors, such as state and local consent laws, that influence sexual health discussions that were not evaluated in our study. Yet, 100% of participants endorsed the intention to obtain a confidential sexual health history in high-risk adolescents, suggesting that some understanding of confidentiality was inherently present in respondents. In our study design, we used close-ended questions to allow for meaningful categorization. Hospitalists' attitudes and barriers could be more deeply explored by using qualitative methods.

Our findings reveal that pediatric hospitalists care for an adolescent population that is at risk for pregnancy complications, and they generally agree that reproductive care is appropriate in the inpatient setting. However, numerous actionable barriers were identified, highlighting the critical need for future interventions aimed at improving adolescent reproductive care in this setting. Future efforts to facilitate reproductive care by pediatric hospitalists should be focused on the provision of comprehensive

education with a focus on pregnancy prevention services.

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Adolescent Reproductive Health Care: Views and Practices of Pediatric Hospitalists

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