



Evaluation of the Reproductive Care Provided to Adolescent Patients in Nephrology Clinics: A Pediatric Nephrology Research Consortium Study

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Introduction

According to U.S Department of Health and Human Services 2020 Statistics, approximately 20 million of the 333 million persons living in the United States are adolescent females [1]. However, studies examining the reproductive care provided to adolescent females with kidney disease are scarce. Adolescents with CKD or end-stage renal disease (ESRD) are at a critical transition phase. Many issues arising during adolescence can directly or indirectly affect renal as well as reproductive outcomes [2, 3], including the effect of hormonal contraception on kidney physiology, a higher frequency of menstrual irregularities in patients with kidney disease, the potential for teratogenicity from kidney disease medications, and the need for preconception counselling about the risks of pregnancy for the mother and fetus.

Despite these needs, confidence levels related to these topics among nephrologists managing women's health issues in patients with CKD appear to be low. In a recent study conducted in the United States and Canada, over 65% of surveyed nephrologists treating adult women with CKD lacked confidence managing women's health issues including menopause, family planning, and pregnancy. Interestingly, 89% felt that opportunities for improving competency in these areas were needed. Uncertainties in the literature, lack of clinical exposure, and lack of knowledge were cited as practice barriers [4].

However, no similar study has been conducted among nephrologists managing adolescent females with CKD. Therefore, we sought to describe current practices among nephrologists in managing women's health issues in adolescents with CKD, including confidence levels in providing this type of care and perceived need for formal training in this area.

Materials & Methods

Survey Design and Sample Size

The study was designed as a cross-sectional assessment. The study was reviewed by the Texas Tech University Health Sciences Center Institutional Review Board and was exempt from requiring participant consent due to the anonymity of the survey answers. The survey questions were developed and reviewed by a team of pediatric nephrologists. The questions were grounded on a thorough literature review of qualitative and quantitative studies of adolescent females and women's health topics. The survey was first discussed and tested within a small group of expert nephrologists that care for adolescent females and young adult females. In 2018, the survey was presented to a larger group at a Pediatric Nephrology Research Consortium (PNRC) meeting. The survey was distributed electronically from April to September 2019 using Qualtrics Online Survey Platform to 305 adult nephrologists and pediatric nephrologists who were members of the PNRC. Reminder emails were sent monthly. Survey submissions were voluntary and anonymous. The survey included a total of 19 questions (Supplementary Figure 1). The first questions addressed provider characteristics, including: demographics (age and gender); years in practice as a nephrologist; practice location (response options in Table 1); prior formal training in obstetric nephrology and/or women's health. Providers were then asked to report how frequently they documented adolescents' ages at menarche, menstrual cycle history and patterns, contraceptive use, sexual activity, history of sexually transmitted disease, discussions about fetotoxicity or infertility risks associated with specific medications, and discussions about family planning. These responses were rated using a Likert scale, on a spectrum of "Never" to "Always". Finally, provider confidence managing reproductive health and pregnancy-related issues in adolescent females with CKD/ESRD were assessed using a Likert Scale, on a spectrum of "Not at all" to "Very Confident".

Data Analysis

All survey responses were summarized and analyzed using descriptive statistics (percentages or frequencies) via the Qualtrics Data Analysis Platform

Provider Demographics and Practice Characteristics

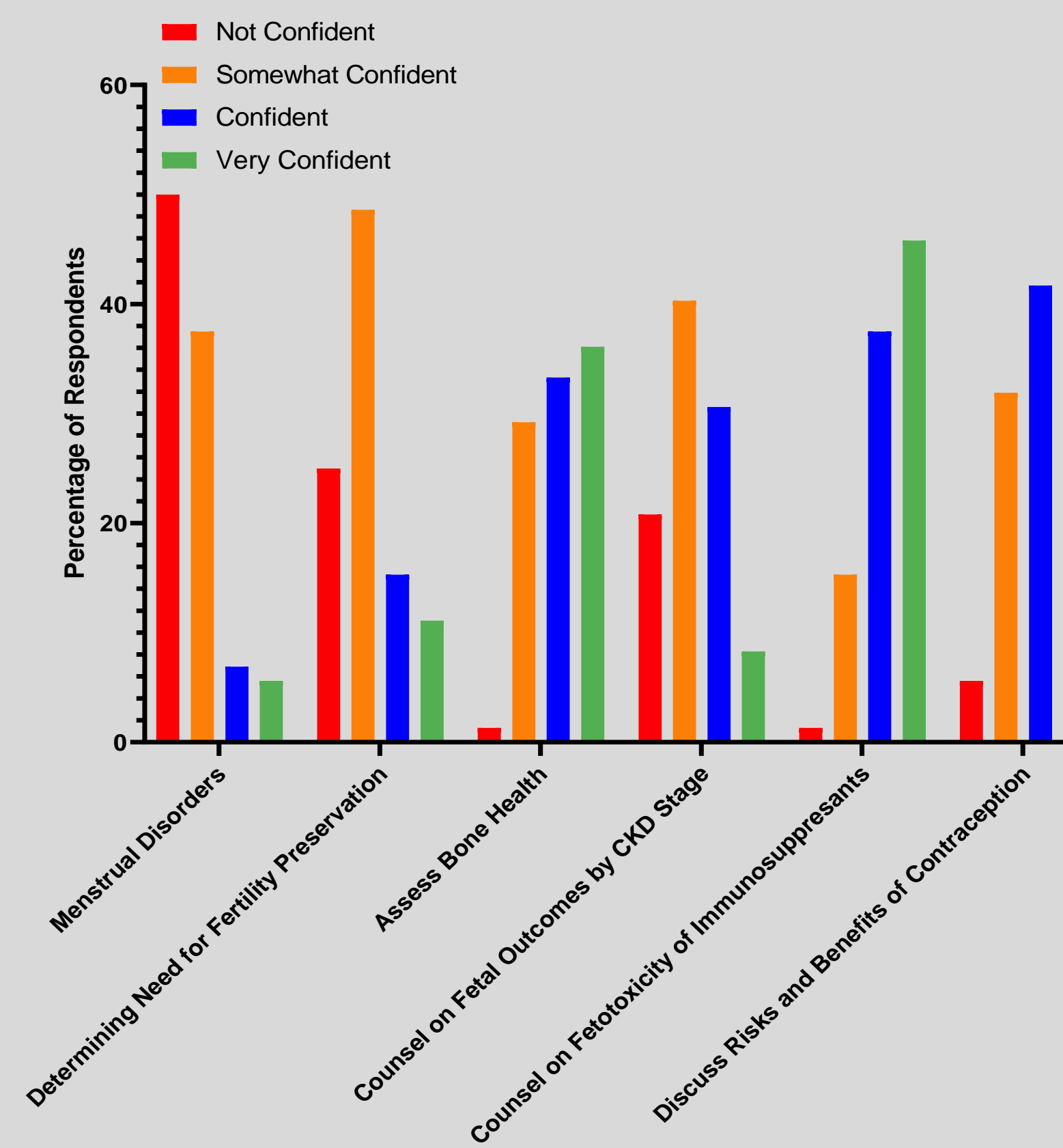
Demographic characteristics		Percentage of Providers
Gender	Male	32
	Female	65.3
	Prefer not to answer	2.7
Age	30-40	30.6
	41-50	36
	51-60	16.3
	>60	10.6
	Prefer not to answer	6.5
Current Location of Practice	United States of America	98.7
	Puerto Rico	1.3
Current Practice setting	Academic/University	88
	Hybrid	8
	Other	4
Scope of Practice	Pediatric Nephrology	94.9
	Adult Nephrology	5.1
Percentage time dedicated to clinical care	0-24%	6.7
	25-49%	16.0
	50-74%	36.0
	75-100%	41.3
Percentage of patient population that is adolescent	0-24%	12
	25-49%	64
	50-75%	24
	75-100%	0
Received formal training in either of these areas?	Obstetric Nephrology	1.3
	Women's Health	0
	Neither	98.7

Frequency of discussion and/or documentation of fertility preserving options and fetotoxicity of commonly prescribed renal drugs

How often do you document each of the following items for your adolescent patients?	Never	Rarely	Sometimes	Often	Always
Documentation of a discussion on the risk of fetotoxicity with ACEIs/ARBs or mycophenolate use	0.0	0.0	6.9	16.7	76.3
Document a negative pregnancy test before starting a fetotoxic medication	9.9	27.0	16.9	18.3	28.2
Discuss the risk of infertility with cyclophosphamide	0	0	1.5	5.9	92.6
Discuss the fertility-preserving options (hormonal ovarian suppression, oocyte cryopreservation) with exposure to cyclophosphamide	4.5	7.6	13.6	28.8	45.5
Discussion on patient's desire for future pregnancy	1.4	20.0	37.1	27.1	14.2

Represented as %

Confidence level on ability to discuss contraceptive measures, menstrual disorders, fetotoxicity/fetal outcomes, and fertility preservation with adolescents

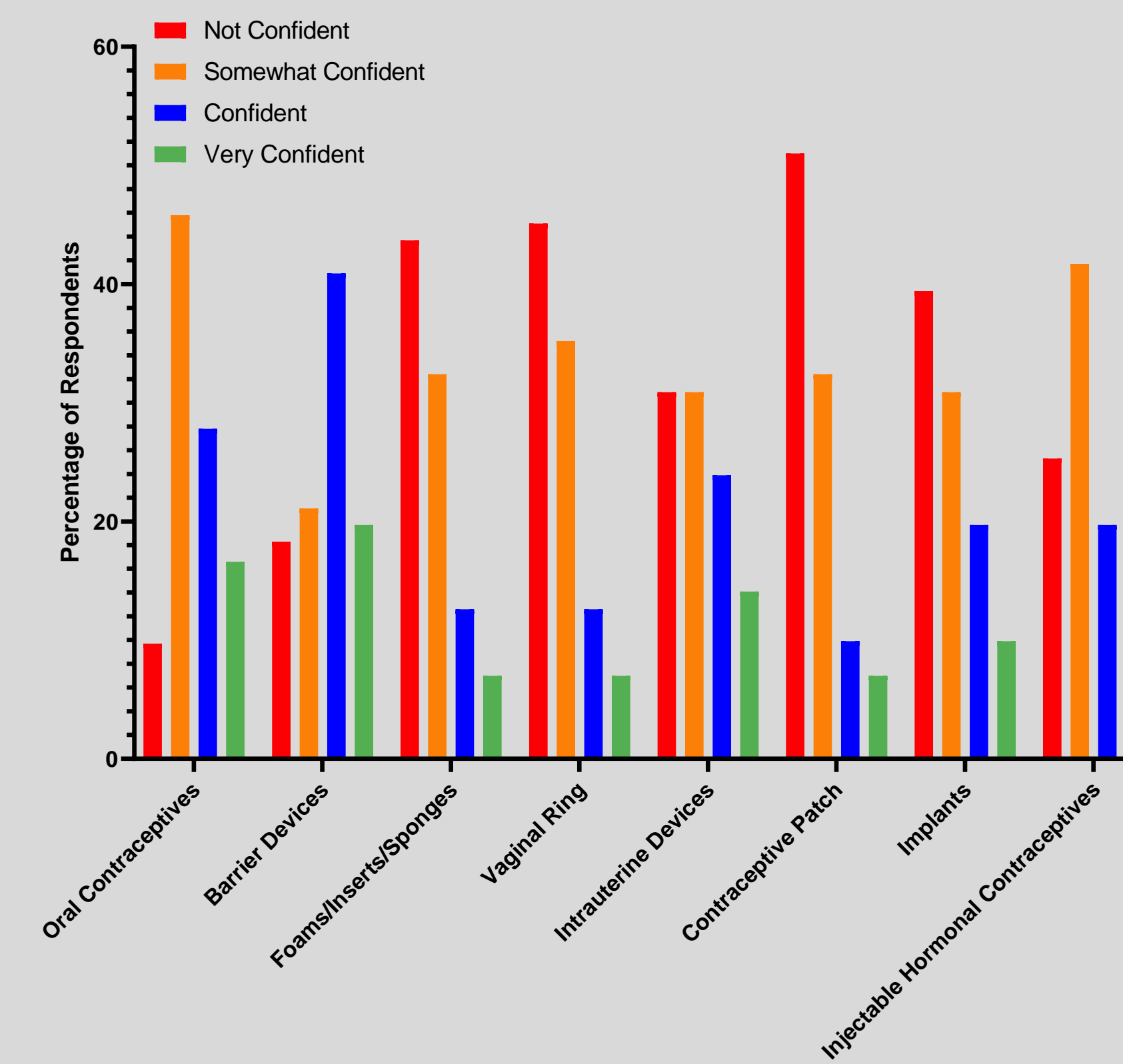


Frequency of documentation in patient charts about sexual and menstrual health, and fertility desire/risks

How often do you document each of the following items for your adolescent patients?	Never	Rarely	Sometimes	Often	Always
Age at menarche	4.2	12.5	33.3	37.5	12.5
Pregnancy history	9.6	24.2	14.5	14.5	37
History of pregnancy termination/loss	18.6	27.2	15.2	13.6	25.4
Date of last menstrual period	11.3	24.0	32.4	19.8	12.7
Prior contraceptive use	7.1	14.3	47.1	24.3	5.7
Prior sexual activity	7.0	22.5	43.7	21.1	5.6
Sexual Partner preference	19.7	38	29.6	9.9	2.8
Number of sexual partners	26.8	47.9	18.3	2.8	4.2
History of Sexually transmitted Infections	9.9	28.2	36.6	17.0	8.5

Represented as %

Confidence level of providers on discussing different types of contraceptives



Discussion

This survey provides insights into the practices and confidence levels of nephrologists managing reproductive and women's health issues in adolescent female patients with CKD. While most providers cared for adolescent patients, an overwhelming majority denied having received any formal training in obstetric nephrology or women's health. Together, our findings support those from prior studies among adult patients showing low physician confidence and insufficient training on topics concerning women's health, and highlight the need for enhanced training for nephrologists regarding women's health issues.

We observed that within the last year, all providers had counselled adolescents of child-bearing age with CKD about contraception, although only 10% were prescribing contraceptives. Further, many of the surveyed nephrologists lacked confidence in discussing individual contraceptive options with adolescents. Our findings support previous studies reporting low physician confidence in discussing contraceptive measures with adolescents and adults across a spectrum of medical specialties. Furthermore, we also noted that an average of 31.9% of providers did not feel comfortable at all talking with adolescents about long-acting reversible contraceptives (LARCs), which include intrauterine devices (IUDs), implants, and injectables. However, the American Academy of Pediatrics and American College of Obstetrics and Gynecology both recommend LARCs as first-line contraception for adolescent females, as these types of contraceptives have been deemed safe for use by adolescents. Furthermore, LARCs can be used to treat dysmenorrhea and can help reduce teen pregnancies, since they require little to no maintenance. We also found that nephrology providers also only infrequently documented the details of adolescent patients' menstrual cycles. This is in agreement with prior studies, which showed that there are inconsistencies in menstrual cycle documentation in pediatric clinics across the United States. Since the American Academy of Pediatrics classifies the menstrual cycle as a vital sign, documentation of LMP in adolescents should be a standard clinical practice. In addition to providing knowledge of the overall health of the individual, documentation of the menstrual cycle can also allow physicians to begin talking with patients about potential contraceptives. Irregular menstrual cycles, which affect approximately 25% of adolescent females, can impact the quality of life of adolescents, and therefore, can be addressed by physicians by prescribing contraceptives for menstrual irregularity. Discussing contraceptive use is especially important in nephrology clinics, since pregnancy in patients with CKD and other kidney disorders can be risky, and will require close observation throughout the pregnancy. It is important for nephrologists not to assume that another provider has addressed menstrual issues in their patients living with CKD. Knowledge of patient's values and goals in relation to pregnancy and fertility is an integral part of discussions with adolescent CKD patients, especially given their impending transition to adulthood. We observed that 92.6% of providers discussed potential infertility with the use of cyclophosphamide, while 76% discussed fetotoxicity of ARBs and ACEIs, and 50% were confident discussing fertility preservation in patients with CKD. However, pregnancy history and desires for future pregnancy were only infrequently documented by providers, which is worrying given that multiple studies have identified pre-pregnancy planning as a key to optimizing maternal and fetal outcomes. These findings are similar to those from a recent survey of adult nephrologists, where only half of providers documented a pregnancy history. Given that the vast majority of pediatric nephrologists surveyed in our study transferred the care of their adolescent CKD patients to an adult nephrologist once they became pregnant, we wonder whether this lack of clinical exposure (in addition to lack of formal training) compounds the poor confidence of nephrologists in counseling adolescents with CKD about pregnancy risks. This observation is concerning, since the transition of care in such pregnant patients is often very abrupt at a time when they are dealing with the significant stress of an adolescent pregnancy.

Conclusions

In summary, nephrologists who care for female adolescent patients are very well positioned to address their female patients' emerging fertility and reproductive needs and/or problems. However, we identified key elements of adolescents' menstrual, sexual, and reproductive histories that are only infrequently documented by nephrologists, and that the providers lack confidence prescribing contraception, counseling about pregnancy risks, and managing pregnancy in adolescent patients with CKD. More formal training in women's health and obstetric nephrology during fellowships, and greater clinical exposure to pregnant adolescents and women, would likely improve provider competence and confidence in the future, thus enabling nephrologists to better care for female adolescents with CKD and to more safely transition them into adulthood.

Acknowledgements

