Journal of Child Sexual Abuse

ISSN: 1053-8712 (Print) 1547-0679 (Online) Journal homepage: http://www.tandfonline.com/loi/wcsa20

Children's Knowledge of Genital Anatomy and Its Relationship With Children's Use of the Word "Inside" During Questioning About Possible Sexual Abuse

Lisa J. Milam & William R. Nugent

To cite this article: Lisa J. Milam & William R. Nugent (2017) Children's Knowledge of Genital Anatomy and Its Relationship With Children's Use of the Word "Inside" During Questioning About Possible Sexual Abuse, Journal of Child Sexual Abuse, 26:1, 23-39, DOI: 10.1080/10538712.2016.1269863

To link to this article: http://dx.doi.org/10.1080/10538712.2016.1269863

Published online: 17 Feb 2017.

JOURNAL OF CHILD SEXUAL ABUSE
2017, VOL. 26, NO. 1, 23–39
http://dx.doi.org/10.1080/10538712.2016.1269863

Routledge
Taylor & Francis Group

Children's Knowledge of Genital Anatomy and Its Relationship With Children's Use of the Word "Inside" During Questioning About Possible Sexual Abuse

Lisa J. Milam[a] and William R. Nugent[b]

[a]Metropolitan Nashville General Hospital, The Our Kids Center, Nashville, Tennessee, USA; [b]College of Social Work, The University of Tennessee, Knoxville, Tennessee, USA

ABSTRACT

This study was designed to examine the relationship between children's understanding of their genital anatomy and their use of the word "inside" in response to questions about genital touch during a forensic medical examination. This study involved a secondary data analysis of 674 records of children at a sexual abuse clinic in a large city in a southern state. Data were analyzed using contingency table, binary logistic, and multinomial logistic regression analysis methods. An association between children's understanding of genital anatomy and their use of the word "inside" to describe genital touch was found. Children's age and development contributes to their overall understanding of genital anatomy, and their knowledge of genital anatomy appears to influence how they answer questions regarding genital touch. This finding could play an important role in sexual abuse cases in states where the definition of rape includes penetration of any bodily opening, including labial penetration.

ARTICLE HISTORY
Received 29 June 2016
Revised 28 November 2016
Accepted 3 December 2016

KEYWORDS
child sexual abuse; genital anatomy; sexual abuse investigation

The extent to which children understand basic human anatomy has received some attention in the literature (Carey, 1985; Gellert, 1962; Jaakkola & Slaughter, 2002; Mintzes, 1984; Prokop, Fančovičová, & Tunnicliffe, 2009; Springer & Keil, 1989). The focus of this research has been on biological versus psychological differentiation and attribution of the workings of anatomy. Carey (1985) suggested that children under the age of 10 had little understanding of anatomy or body function as a biological process, while others found that children do have an ability to distinguish bodily functions and organs as a biological process that affect life or death (Jaakkola & Slaughter, 2002). Schor and Sivan (1989) reported results of a study of how children labeled genitals when questioned using anatomically detailed dolls. They noted that many children were able to label breasts, buttocks, and penis correctly and that older children were more accurate than younger children. While the use of anatomically detailed dolls offers a three-dimensional representation of genital anatomy, dolls are a poor substitute for human

CONTACT Lisa J. Milam lisa.milam@nashvilleha.org 1804 Hayes Street, Nashville, TN, USA 37203.

anatomy. Research focused on a child's understanding of genital anatomy as a biological or psychological process is useful in understanding child development, but children's understanding and knowledge of genital anatomy is also an important consideration during questioning regarding allegations of child sexual abuse.

Researchers have sought natural scenarios in which children experience genital touch as a framework to ask questions about that experience (Bruck, Ceci, & Francoeur, 2000; Bruck, Ceci, Francoeur, & Renick, 1995; Saywitz, Goodman, Nicholas, & Moan, 1991). These researchers utilized the genital exam as a way to explore the manner in which children reported an experience of genital contact. This research examined the accuracy of children's reports when questioned about their exam experience but yielded no information on how children understand anatomy or how that understanding may influence the answers children provide when questioned about touching of their genital area (Dupree, Patterson, Nugent, & White, 2015).

Children's use of language in the context of a child sexual abuse interview has also received attention in the literature (Poole & Lamb, 1998; Walker & Warren, 1995), but a child's use of language in describing genital touch has received less attention. A review of the literature yielded no study that attempted to quantify how children, and in particular girls, understand their own genital anatomy. In addition, nothing was found pertaining to how this understanding might explain a normal genital exam when there are allegations of child sexual abuse.

Normal medical exams are the expected finding in cases of child sexual abuse (Adams et al., 2016; Gallion, Milam, & Littrell, 2016; Heger, Ticson, & Velasquez, & Bernier, 2002). Kellogg, Menard, and Santos (2004) found that a child can sustain vaginal penetration without suffering any genital injury, and Anderst, Kellogg and Jung (2009) found that children referred for forensic medical exams often have normal exams even when there are reports of multiple episodes of penetration. The possibility of vaginal penetration without injury is plausible and can be explained when considering the adolescent victim who has anatomy more similar to an adult; however, known vaginal penetration without injury in young children is not empirically supported. Descriptions of penetration by young children who were found to have normal exams have been noted in the literature (Anderst, et al., 2009; Gallion et al., 2016; Heger et al., 2002). This history of penetrating trauma in young children who have normal exams frequently leads to questions regarding the validity of the statements by these children. Whether children are "misunderstanding" their experience (Heger et al., 2002) or whether they are describing labia penetration rather than vaginal penetration (Anderst, et al., 2009), it is important for adults to assess the validity of child sexual abuse allegations based on a correct assessment not only of the child's physical exam but also of the child's statements in the context of the child's

use of language. A more complete understanding of how children use and understand the word "inside" might explain normal exam findings when children give a history of penetrating trauma.

Literature review

Child sexual abuse continues to be a significant social, medical, and legal problem. Current research estimates that approximately 20% of girls and 10% of boys will experience some form of child sexual abuse by age 18 (Barth, Bermetz, Heim, Trelle, & Tonia, 2013; Pérez-Fuentes et al., 2012). For purposes of this study, child sexual abuse is defined as sexual contact experienced by any child under age 13; sexual contact by a relative, caretaker, or someone living in the child's home to any child under age 18; sexual contact to a child age 13–17 by someone more than 4 years older than the child; or any forced sexual contact to a child under the age of 18 (TCA 37–1-602).

Psychological sequelae that result from child sexual abuse has been well-documented (Dworkin, Javadani, Verona & Campbell, 2014; Finkelhor, 1994; Pérez-Fuentes et al., 2012; Seng, D'Andrea, & Ford, 2014; Young, Deardorff, Ozer, & Lahiff, 2011), and a litany of adult psychological disturbances have been shown to be associated with a history of child sexual abuse (Basile, Chen, Black, & Saltzman, 2007; Cukor & McGinn, 2006; Tyrka, Wyche, Kelly, Price, & Carpenter, 2009). Historically, the protection and safety of children as well as the prosecution of child sexual abuse offenders was based on the presence of forensic evidence or physical findings (DeJong, 1998; Palusci et al., 1999).

Given that the vast majority of children who describe penetration have normal anogenital examinations (Gallion et al., 2016; Heger et al., 2002), the credibility of these children is often brought into question. Walsh, Jones, Cross, and Lippert (2008) found that the majority of cases investigated between 2001 and 2003 and referred for prosecution included at least two types of evidence: the child's statement and a corroborating witness. The National Center for the Prosecution of Child Abuse (2004) endorses the view that the testimony of a child is sufficient for successful prosecution of child sexual abuse cases, which is important given the evidentiary importance of children's statements (Myers, 2002). Thus, evaluation of a child's statement in the context of her or his use of language and development is key.

What is lacking in the literature is an exploration of how children understand genital anatomy in the context of internal versus external anatomy and, even more specifically, the degrees of internal genital anatomy (i.e., labial penetration versus vaginal penetration). Children may answer "yes" to a question of whether anything went inside their bodies, and young children may well demonstrate that something went "inside" even when it did not

(Bruck et al., 2000, 1995). There is, however, little clarity regarding what it means when a child uses the word "inside" when answering questions about genital contact. In addition to questions about the general knowledge of children regarding genital anatomy, prior research has also suggested that children of color may have less knowledge of genital anatomy than their White counterparts (Cooper & Koch, 2007; Koff & Rierdan, 1995; Scott, Arthur, Panizo, & Owen, 1989; White, 2013). The use of language by children when describing genital contact in the context of a forensic sexual abuse exam has not been studied.

The type of contact a child may have sustained during an alleged sexual assault is critical. Decisions are made regarding testing for infection and/or pregnancy as well as the interpretation of exam findings. The genital anatomy and physical development of pubertal children allows them to have a completely normal exam even when full vaginal penetration has occurred (Kellogg et al., 2004). The explanation for normal exams in young children who describe penetration may be rooted in language development and basic knowledge of genital anatomy.

This article reports the results of a study conducted to investigate correlates of female children's use of particular words during a medical history in response to questions about possible penetration. We hypothesized the following:

(1) Controlling for race/ethnicity, older children will demonstrate more accurate knowledge of genital anatomy.
(2) Controlling for age, minority girls will have less accurate knowledge of their genital anatomy than Caucasian girls.
(3) Controlling for age, minority status, history of sexual abuse, and acuity of referral, girls with more accurate knowledge of female genital anatomy will be less likely to use the word "inside" to describe the part of their genital anatomy touched during wiping after urination than girls with less accurate knowledge of female genital anatomy

In this secondary data analysis, the records of 674 girls between the ages of 5 and 17 were studied. The girls in this analysis were examined secondary to concerns of possible sexual abuse at an outpatient clinic affiliated with a teaching hospital at a major southern university. These girls were asked a series of questions to assess their knowledge of genital anatomy and the concept of penetration. The original study (Gallion et al., 2016) explored correlations between the child's history, the caretaker history, and the results of their forensic medical exam. The primary objective of the current study was to examine how female children use the word "inside" when questioned about genital touching and their knowledge of genital anatomy. An assumption was that when children engage in normal hygiene associated with

toileting activities that they touch their own genital area and that this touching involves penetration of the labia but not penetration of the vagina (i.e., when a child uses toilet paper to wipe her genital area after urination, she likely "penetrates" the labia but does not penetrate the vagina). The act of wiping after urination presented an ideal opportunity to explore how children use language to report an experience of genital contact.

Methodology

Ethics

Approvals from the institutional review boards of both Meharry Medical College and the University of Tennessee were obtained. A waiver of consent/assent was granted, as this study involved statistical analyses of data routinely collected in the normal course of patient care. Consent for the medical examination from the legal guardian and assent from the child are routinely obtained as part of the standards and protocols of the agency.

Sample of participants

The original study included patients who were enrolled from October 2010 to June 2013 from all female children and adolescents evaluated at a city hospital associated with a major university medical center in a large southeastern state. The hospital provides specialized acute and non-acute forensic medical evaluations for approximately 850 pediatric and adolescent patients annually in whom there are concerns of sexual abuse and/or a pediatric gynecological complaint.

Data for this secondary data analysis study included female children from 5 to 17 years of age who presented to the agency with concerns of sexual abuse. Data from children in state custody were excluded. Data were also excluded if a medical examination was not performed or digital images of the genitalia were not captured.

Demographic and medical data

Demographic data were obtained, including age, genital maturation stage, race, and type of visit (acute: ≤ 72 hours; non-acute: > 72 hours), on each patient. Also collected were information provided by the guardian, medical history from the child if obtained, and the results of the physical examination.

Measurement of the child's knowledge of genitalia

In order to grossly assess the children's knowledge of genitalia, an initial series of questions regarding their anogenital anatomy were asked of children 5 years of age or older during their medical history. These included:

- Has anyone ever talked to you about your private parts [or name provided by child]?
- Do you know the names for those parts of your body?
- What are the names?
- Do you know how many openings or holes you have in that part of your body?

In addition to this initial set of questions, a specific question was asked around the concept of toileting, as it is one of the few activities female children engage in on a daily basis that involves contact to their genitalia. Specifically, the question, "When you wipe after you pee, does it feel like you are wiping on the inside or the outside of your private part [or name provided by child] or both?" was asked. This presented an opportunity to explore in more detail the child's understanding of labial versus vaginal penetration. (This question presumes that at least some children penetrate the labia but not the vaginal canal in the course of normal hygiene related activities.) Of those girls who were menstruating we also asked:

- Do you use pads or tampons or both?
- Do you think menstrual blood/your period comes out of the same hole/opening you pee from or from a different hole/opening?

Based on the answers to these questions, children's responses were then categorized into the following categories:

- Demonstrated accurate knowledge of genital anatomy.
- Demonstrated limited knowledge of genital anatomy.
- Could not be determined (inconclusive).

Children classified as "demonstrated accurate knowledge of anatomy" were as follows:

- Non-menarchal children who articulated that there are three openings in the anogenital area.
- Menarchal children knew and articulated that there are three openings (urethral, vaginal, and anal) in the anogenital area and knew and

articulated that urine and blood come from separate openings in the genital area.

Children classified as "demonstrated limited knowledge of genital anatomy" were as follows:

- Non-menarchal children who reported they knew the number of openings but provided an incorrect number of openings or who didn't know how many openings.
- Menstruating children who did not know how many openings or they did not know urine and blood come from different openings.

A subset of the children could not be categorized into either of these two categories and consequently were categorized as "could not be determined." These included those children who were not asked questions, who responded "I don't know," or who declined to answer questions and those children with missing data for questions related to knowledge of genital anatomy. These cases were treated as missing data on this variable.

The objectives of this secondary data analysis were to explore associations between age, race, and the child's knowledge of genital anatomy. It also examined whether children who demonstrated an understanding of genital anatomy were less likely to use the word "inside" when describing genital touch that does not include vaginal penetration (i.e., touching of the genital area involved in normal hygiene that is associated with wiping after urination). Specifically, data were extracted from the original study database for children who provided a history and answered questions designed to assess their knowledge of genital anatomy and children who were 5 years of age or older.

Prior to the medical examination, a history was gathered from the adult without the child present. Agency social workers obtained a medical history from children 5 years of age and older without the adult present. This included questions about general health, anogenital complaints, behavioral symptoms, and any sexual contact (including peers). The distinction between whether the child experienced (non-penetrating) genital contact or genital penetration was determined based on whether the child and/or the adult reported that an object, the perpetrator's finger(s), or the perpetrator's penis went "inside" the child's genitalia.

Measurement of words used to describe genital touch

The dependent variable in this study was the words a child used in response to a question about genital touching. A primary study question asked of each child during the interview was: "When you wipe after you pee, does it feel

like you are wiping on the inside or the outside of you private part [or name provided by the child] or both?" The child was given three response options: "inside," "outside," or "both." Answers provided by the child were recorded on a data collection tool at the time of questioning or immediately following the interview. Typically, children responded by choosing one of the three options provided. Some children answered immediately before all options were provided, but most provided an answer after all options were presented. Some children responded with "I don't know" instead of one of the options provided. The answers "inside," "outside," "both," and "I don't know" were number coded and these numbers were used as the dependent variable in a multinomial logistic regression.

Data analysis

A contingency table analysis, binary logistic regression analysis, and a multinomial regression analysis were used to test hypotheses. All analyses were conducted using SPSS version 22.

Missing data

Missing data were handled using multiple imputation. Following recommendations of Enders (2010), 10 data sets (maximum amount of missing data, 5.8%) with missing values imputed were generated using SPSS version 22. Results were pooled across the 10 imputed data sets following procedures described by Enders (2010).

Results

Characteristics of children in current study

The original study included 1,500 female children. Of the 1,500 children in the original study, 674 children were eligible for inclusion in this secondary data analysis. The complete flow of study participants is shown in Figure 1. The characteristics of the children in the current study are shown in Table 1.

The mean age of these children was 9.9 (SD = 3.5; range 5 to 17), and 20.9% of referrals were acute, the remaining 79.1% were non-acute. In the current study 83.8% of the children did not demonstrate accurate knowledge of female genital anatomy, while 16.2% did demonstrate accurate knowledge of genital anatomy. Twenty-eight percent of the children responded to the wiping question with "outside," 33.4% with "inside," 19.1% with "both," and 19.4% with "I don't know."

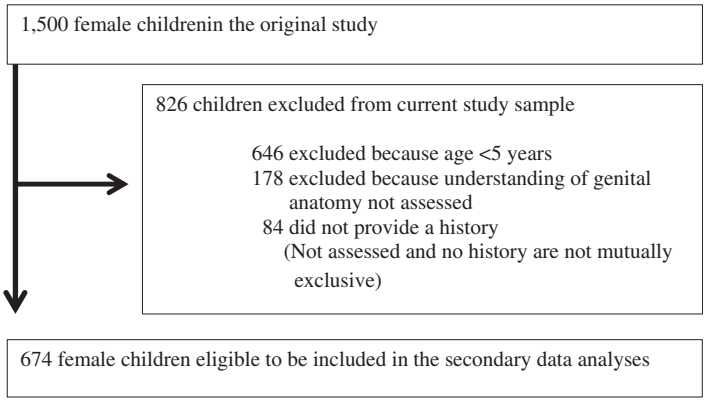

Figure 1. Graphic showing inclusion and exclusion of children from original study into current secondary data analysis.

Table 1. Characteristics and Referral Types of the N = 674 Female Children Included in the Secondary Data Analysis.

Age		
	5–10 years	55% (369/674)
	11–12 years	16% (107/674)
	13–17 years	29% (198/674)
Race		
	White/Not Hispanic	70% (463/674)
	Black/Not Hispanic	19% (126/674)
	Multiracial	6% (42/674)
	Hispanic	4% (30/674)
	Other	2% (13/674)
Acuity of Visit		
	Acute	20.9% (141/674)
	Nonacute	79.1% (533/674)

Missing data

There were no missing data on age, acuity of referral, or minority status. There were 1.2% missing data for history of sexual abuse as reported by the adult caretaker, 2.8% missing data on the child's response to the question about wiping, and 5.8% missing data on the child's understanding of female genital anatomy.

Results of logistic regression test of hypotheses one and two

The results of a logistic regression test of hypotheses one and two are shown in Table 2.

The mean overall chi-square for the logistic regression model across the 10 imputations was statistically significant,$\chi^2(2) = 154.1$, $p < .0001$. Consistent with hypothesis 1, the odds a female child will demonstrate accurate

Table 2. Pooled Results of Binary Logistic Regression Analysis for Hypothesis One Based on 10 Imputations.

Variable	B	Wald	df	P	e^B
Age	.48	87.8	1	<.0001	1.6
Minority status	−.26	.99	1	.32	.77
Constant	−7.09	111.3	1	<.0001	

knowledge of their genital anatomy were 1.6 times greater for each year she was older, $\chi^2(1) = 87.8$, $p < .0001$. Contrary to hypothesis 2, after controlling for age there was no relationship between minority status and female children's knowledge of their genital anatomy, $\chi^2(1) = 0.99$, $p > .05$.

Contingency table results

The results of contingency table analyses of the relationship between knowledge of genital anatomy and the words used in answer to the question about wiping are shown in Table 3 for Caucasian children and in Table 4 for minority children. The relationship between knowledge of genital anatomy and words used in response to the question about wiping was statistically significant for both Caucasian children, mean chi-square across the 10 imputations, $\chi^2(3) = 29.9$, $p < .001$, and for minority children, mean chi-square, $\chi^2(3) = 15.1$, $p < .005$. These results were consistent with research hypothesis 3.

Results of multinomial logistic regression

The results of the multinomial logistic regression with all independent variables in the model were statistically significant with a mean overall chi-square across the 10 imputations, $\chi^2(18) = 76.8$, $p < .0001$. The mean likelihood ratio chi-square test results for the independent variables across the 10

Table 3. Percentages of Caucasian Children With Inaccurate and Accurate Knowledge of Genital Anatomy and the Words They Used to Answer the Question About Wiping.

Word used	Inaccurate knowledge of genital anatomy	Accurate knowledge of genital anatomy	Difference
Inside	34.6%	15.7%	18.9% Z = 3.3, p < .002
Outside	25.5%	50.3%	−24.85.1% Z = 4.4, p < .0001
Both	17.8%	26.3%	−8.5% Z = −1.7, p > .05
I don't know	22.1%	8.0%	14.1% Z = 2.9, p < .01

Table 4. Percentages of Minority Children With Inaccurate and Accurate Knowledge of Genital Anatomy and the Words They Used to Answer the Question About Wiping.

Word used	Inaccurate knowledge of genital anatomy	Accurate knowledge of genital anatomy	Difference
Inside	40.2%	24.6%	15.6% Z = 1.70, p > .05
Outside	20.3%	49.5%	−29.2% Z = −3.5, p < .002
Both	18.3%	21.6%	−3.3% Z = −0.40, p > .05
I don't know	21.2%	4.3%	16.9% Z = 2.2, p < .05

imputations were: age, $\chi^2(3) = 14.33$, p < .02; minority status, $\chi^2(3) = 3.96$, $p > .05$; acuity of referral, $\chi^2(3) = 5.33$, $p > .05$; previous sexual abuse status as reported by the adult caretaker, $\chi^2(3) = 8.54$, $p > .05$; and knowledge of genital anatomy, $\chi^2(3) = 19.5$, $p < .001$.

The mean Pearson goodness-of-fit value was, $\chi^2(334) = 340.4$, $p > .05$, and the mean deviance value was, $\chi^2(334) = 369.1$, $p > .05$. Both these goodness-of-fit statistics were consistent with a good fitting model. The mean percentages of correct classification by this statistical model were: for use of the word "outside," 48.5%; use of the word "inside," 76.3%; use of the word, "both," 7.5%; and for use of the words, "I don't know," 0.0%. The parameter estimates for the multinomial regression model are shown in Table 5.

The results suggested that the odds of a child with accurate knowledge of female genital anatomy used the word "inside" in response to the wiping question, controlling for covariates, were about .4 times as great as the odds she used the word "outside"; said differently, the odds a child with accurate knowledge of genital anatomy used the word "outside" were about 2.5 times greater than the odds she used word "inside" in response to the question about wiping after urination. The odds a child with accurate knowledge of female genital anatomy used the words "I don't know" in response to the wiping question were about .25 times as great as the odds she responded with "outside." Said differently, the odds a child with accurate knowledge of her genital anatomy responding with "outside" to the question about wiping were about 4 times as great as the odds she answered with "I don't know." Controlling for covariates, there appeared to be no relationship between knowledge of female genital anatomy and the use of the response "both" to the wiping question.

Table 5. Results of Multinomial Logistic Regression Analysis of Pooled (Over 10 Imputations) Imputed Data, With the Answer "Outside" Used as the Reference Category.

	B	Wald	p	e^B
"Inside"				
Intercept	2.30	31.72	< .001	
Age	−.11	10.0	.002	.90
History of sexual abuse	.16	.26	.61	1.17
Minority status	.43	3.50	.06	1.54
Acuity	−.33	1.61	.21	.72
Accurate understanding of genital anatomy	−.95	8.36	.004	.39
"Both"				
Intercept	.46	1.11	.29	
Age	−.09	4.55	.033	.92
History of sexual abuse	.84	7.25	.007	2.32
Minority status	.25	.83	.36	1.28
Acuity	−.56	3.59	.06	.57
Accurate understanding of genital anatomy	−.03	.01	.92	.97
"I don't know"				
Intercept	2.31	19.34	< .001	
Age	−.11	8.12	.004	.89
History of sexual abuse	.44	1.65	.20	1.55
Minority status	.21	.61	.44	1.23
Acuity	−.54	3.02	.08	.58
Accurate understanding of genital anatomy	−1.38	9.07	.003	.25

Discussion

Based on results from this study it is reasonable to consider that younger girls use the word "private part" (or their designated term for that part of the body) as a catch-all for the entire genital area. Older girls who have more accurate knowledge of genital anatomy may hear the word "private part" as synonymous with "vagina," which may result in a different internal interpretation of the question. An appreciation for language and development of language is important when asking questions of children and evaluating their answers.

Prior researchers have speculated that children may have "misunderstood" (Heger et al., 2002) their experience, suggesting that the child's use of the word "inside" was incorrect. Other researchers have speculated that children are describing labial penetration rather than true vaginal penetration (Anderst, et al., 2009) when they use the word "inside" in response to questions regarding genital contact. Our findings may offer confirmatory support for the latter theory. Younger girls did appear to use the word "inside" to describe genital contact that involves only penetration of the labia or genital opening, whereas older girls appeared to limit their use of the word "inside" to penetration of the vagina. This study suggested that when an older girl is questioned about an experience of genital touching and is asked whether anything went "inside" her "private part," she may say "no" if the contact is limited to labial penetration. As children develop, their

understanding of the knowledge they have is filtered through a lens of cultural and societal beliefs. Poole and Lamb (1998) referred to this concept in their discussion of semantics and pragmatics. Words have different meanings based on developmental levels as well as cultural norms. The findings of this research are important for investigators and interviewers who are questioning children regarding sexual contact. It is also an important finding for health care providers attempting to reconcile a normal medical exam in the context of a history of penetrative contact.

Prior research has suggested that children of color may have less knowledge of genital anatomy than their White counterparts (Cooper & Koch, 2007; Koff & Rierdan, 1995; White, 2013). While there was an association between age and knowledge of genital anatomy, no such association was found with respect to racial or ethnic variations in this sample of children seen for a forensic medical evaluation secondary to concerns of sexual abuse.

The findings from this current study suggest it is both the definition of penetration and the child's knowledge of anatomy that must be carefully considered when questioning a child. At present there is a continued reluctance to believe young girls when they describe penetration but have a normal medical exam. There is also a belief that older girls who say nothing went inside may not have been victims of rape. Interviewers and investigators should be mindful that young children could experience and describe penetration of the body (rape) that may not have included vaginal penetration. In addition, older girls may be limiting their description of penetration to vaginal penetration. The question for older girls is not just whether something went inside their "vagina" but whether something went inside any part of their genital area.

Limitations

This study has several limitations. Highly skilled interviewers questioned children, and the questions were standardized to the extent possible; however, there were ambiguities. For example, when a child was asked how many openings she had in her genital area, the query may not have been immediately understood in the way the interviewer intended for it to be understood. This possibly resulted in the child being confused and a need for the interviewer to phrase the question differently. Another limitation was the absence of a way to establish what "inside" meant to a child. It was also not possible in this study to know with certainty what type of genital contact a child actually experienced or how this influenced answers to questions.

Children in this study were potentially subjected to previous questioning related to genital touch, which could have influenced answers provided at the time of their clinic visit. It is possible that a group of children not previously exposed to questioning related to genital touch would have answered

questions differently. The questions used to assess a child's knowledge of genital anatomy and the subsequent categorizing of how children understood anatomy were not based on a standardized questionnaire since no such questionnaire exists. The study authors conceptualized basic questions designed to assess knowledge of genital anatomy, but the reliability and validity of the method has not been tested.

Perhaps the most significant limitation is the study question, "When you wipe after you pee, does it feel like you are wiping on the inside or the outside of your private part [or whatever word the child uses to describe the genital area] or both?" It is reasonable to argue that most children in the study experienced penetration of the labia in some form or fashion in the normal course of self-care and hygiene, but there was no way to test this assumption prior to questioning of children. The idea that some type of labial "penetration" that did not include penetration of the vaginal canal could have occurred during an experience of wiping after urination is valid, but there is no way to establish with certainty whether any particular child truly experienced any type of labial or vaginal penetration of any kind at any point in time.

Conclusion

If the question about wiping is conceptualized as an indirect way of inquiring about genital penetration, and the verbal question is thought of as a type of item in a measurement procedure, the results suggested that questions about genital penetration may show differential item functioning (DIF) with respect to age and knowledge of genital anatomy. Thus, the expected response to a question about genital penetration may not only be a response indicative of the occurrence or non-occurrence of genital penetration but also of some other construct associated with age and knowledge of genital anatomy. If correct, this implies that the inferences made from children's responses to inquiries about possible genital penetration may need to be interpreted differently for children of different ages and with different levels of knowledge of genital anatomy (Zumbo, 2007). Future research needs to be done investigating this conjecture.

Additional research related to how children understand and report genital touch is important given that the child's history is most important when making decisions regarding child sexual abuse cases. Laws governing criminal prosecution of rape or other sexual offenses against children require that children be able to provide specific information about their experience. Children are very competent historians, and their competence is revealed only when questions are asked in developmentally appropriate language that allows them to accurately report their experiences. The information they

provide will dictate the child protection issues, health care decisions, and criminal charges that may result from a child sexual abuse investigation.

Compliance with ethical standards

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

Notes on contributors

Lisa Milam is a forensic social worker at the Our Kids Center at the Metropolitan Nashville General Hospital in Nashville, Tennesee. She received her MSSW and DSW from the University of Tennessee.

William Nugent is a professor at the University of Tennessee College of Social Work. He received the Chancellor's Excellence in Teaching Award in 2015 and was named as a Society for Social Work Research Fellow in 2014.

References

Adams, J. A., Kellogg, N. D., Farst, K. J., Harper, N. S., Palusci, V. J., Frasier, L. D., … Starling, S. P. (2016). Updated guidelines for the medical assessment and care of children who may have been sexually abused. *Journal of Pediatric and Adolescent Gynecology*, *29*, 8–87.

Anderst, J., Kellogg, N., & Jung, I. (2009). Reports of repetitive penile–genital penetration often have no definitive evidence of penetration. *Pediatrics*, *124*, e403–e409. doi:10.1542/peds.2008-3053

Barth, J., Bermetz, L., Heim, E., Trelle, S., & Tonia, T. (2013). The current prevalence of child sexual abuse worldwide: A systematic review and meta-analysis. *International Journal of Public Health*, *58*(3), 469–483. Retrieved from http://search.proquest.com/docview/1492674165?accountid=14766

Basile, K. C., Chen, J., Black, M. C., & Saltzman, L. E. (2007). Prevalence and characteristics of sexual violence victimization among U.S. adults. *Violence and Victims*, *22*, 437–448. doi:10.1891/088667007781553955

Bruck, M., Ceci, S. J., & Francoeur, E. (2000). Children's use of anatomically detailed dolls to report genital touching in a medical examination: Developmental and gender comparisons. *Journal of Experimental Psychology: Applied*, *6*(1), 74–83. doi:10.1037/1076-898X.6.1.74

Bruck, M., Ceci, S. J., Francouer, E., & Renick, A. (1995). Anatomically detailed dolls do not facilitate preschoolers' reports of a pediatric examination involving genital touching. *Journal of Experimental Psychology: Applied*, *1*(2), 95–109. doi:10.1037/1076-898X.1.2.95

Carey, S. (1985). *Conceptual change in childhood*. Cambridge, MA: MIT Press. http://search.proquest.com/docview/619085971?accountid=14766

Cooper, S. C., & Koch, P. B. (2007). "Nobody told me nothin": Communication about menstruation among low-income African-American women. *Women & Health*, *46*, 57–78. doi:10.1300/J013v46n01_05

Cukor, D., & McGinn, L. K. (2006). History of child abuse and severity of adult depression: The mediating role of cognitive schema. *Journal of Child Sexual Abuse: Research, Treatment, & Program Innovations for Victims, Survivors, & Offenders*, *15*(3), 19–34. doi:10.1300/J070v15n03_02

DeJong, A. R. (1998). Impact of child sexual abuse medical examinations on the dependency and criminal systems. *Child Abuse & Neglect*, *22*, 645–652. doi:10.1016/S0145-2134(98)00041-6

Dupree, L., Patterson, D., Nugent, W., & White, S. (2015). How children verbally reported their experiences of a genital exam. *Journal of Human Behavior in the Social Environment*, *26*(1), 110–118. doi:10.1080/10911359.2015.1062675

Dworkin, E., Javdani, S., Verona, E., & Campbell, R. (2014). Child sexual abuse and disordered eating: The mediating role of impulsive and compulsive tendencies. *Psychology of Violence*, *4*(1), 21–36. doi:10.1037/a0031779

Enders, C. K. (2010). *Applied missing data analysis*. Guilford Press, New York, NY.

Finkelhor, D. (1994). Current information on the scope and nature of child sexual abuse. *The Future of Children, 4*(2), 31–53. Retrieved from http://search.proquest.com/docview/619347894?accountid=14766

Gallion, H. R., Milam, L. J., & Littrell, L. L. (2016). Genital findings in cases of child sexual abuse: Genital vs. vaginal penetration. *Journal of Pediatric and Adolescent Gynecology*, *29*, 604–611. doi:10.1016/j.jpag.2016.05.001

Gellert, E. (1962). Children's conceptions of the content and functions of the human body. *Genetic Psychology Monographs*, *65*, 291–411.

Heger, A., Ticson, L., Velasquez, O., & Bernier, R. (2002). Children referred for possible sexual abuse: Medical findings in 2384 children. *Child Abuse & Neglect*, *26*, 645–659. doi:10.1016/S0145-2134(02)00339-3

Jaakkola, R. O., & Slaughter, V. (2002). Children's body knowledge: Understanding 'life' as a biological goal. *British Journal of Developmental Psychology*, *20*(3), 325–342. doi:10.1348/026151002320620352

Kellogg, N. D., Menard, S. W., & Santos, A. (2004). Genital anatomy in pregnant adolescents: "normal" does not mean "nothing happened." *Pediatrics*, *113*, e67–e69. doi:10.1542/peds.113.1.e67

Koff, E., & Rierdan, J. (1995). Early adolescent girls' understanding of menstruation. *Women & Health*, *22*, 1–19. doi:10.1300/J013v22n04_01

Mintzes, J. J. (1984). Naive theories in biology: Children's concepts of the human body. *School Science and Mathematics*, *84*(7), 548–555. doi:10.1111/ssm.1984.84.issue-7

Myers, J. E. B. (2002). The legal system and child protection. In J. E. B. Myers, L. Berliner, J. Briere, C. T. Hendrix, C. Jenny, & T. A. Reid (Eds.), *The APSAC handbook on child maltreatment* (2nd ed., pp. 1–582). Thousand Oaks, CA: Sage.

National Center for Prosecution of Child Abuse. (2004). *Investigation and prosecution of child abuse* (3rd ed.). Thousand Oaks, CA: Sage.

Palusci, V. J., Cox, E. O., Cyrus, T. A., Heartwell, S. W., Vandervort, F. E., & Pott, E. S. (1999). Medical assessment and legal outcome in child sexual abuse. *Archives of Pediatrics & Adolescent Medicine*, *153*, 388–392. doi:10.1001/archpedi.153.4.388

Pérez-Fuentes, G., Olfson, M., Villegas, L., Morcillo, C., Wang, S., & Blanco, C. (2012). Prevalence and correlates of child sexual abuse: A national study. *Comprehensive Psychiatry*. doi:10.1016/j.comppsych.2012.05.010

Poole, D. A., & Lamb, M. E. (1998). *Investigative interviews of children: A guide for helping professionals*. Washington, DC: American Psychological Association. doi:10.1037/10301-000

Prokop, P., Fančovičová, J., & Tunnicliffe, S. D. (2009). The effect of type of instruction on expression of children's knowledge: How do children see the endocrine and urinary system? *International Journal of Environmental and Science Education, 4*(1), 75–93. Retrieved from http://search.proquest.com/docview/621919344?accountid=14766

Saywitz, K. J., Goodman, G. S., Nicholas, E., & Moan, S. F. (1991). Children's memories of a physical examination involving genital touch: Implications for reports of child sexual abuse. *Journal of Consulting and Clinical Psychology*, *59*(5), 682–691. doi:10.1037/0022-006X.59.5.682

Schor, D. P., & Sivan, A. B. (1989). Interpreting children's labels for sex-related body parts of anatomically explicit dolls. *Child Abuse & Neglect*, *13*(4), 523–531. doi:10.1016/0145-2134(89)90056-2

Scott, C. S., Arthur, D., Panizo, M. I., & Owen, R. (1989). Menarche: The Black American experience. *Journal of Adolescent Health Care*, *10*, 363–368. doi:10.1016/0197-0070(89)90212-X

Seng, J. S., D'Andrea, W., & Ford, J. D. (2014). Complex mental health sequelae of psychological trauma among women in prenatal care. *Psychological Trauma: Theory, Research, Practice, and Policy, 6*(1), 41–49. Retrieved from http://search.proquest.com/docview/1319379623?accountid=14766

Springer, K., & Keil, F. C. (1989). On the development of biologically specific beliefs: The case of inheritance. *Child Development, 60*(3), 637–648. Retrieved from http://search.proquest.com/docview/617609212?accountid=14766

Tennessee Code Annotated Statutory Definitions of Tennessee Sexual and Violent Sexual Offenses. T.C.A. § 37-1-60239-13-501(7).

Tyrka, A. R., Wyche, M. C., Kelly, M. M., Price, L. H., & Carpenter, L. L. (2009). Childhood maltreatment and adult personality disorder symptoms: Influence of maltreatment type. *Psychiatry Research*, *165*(3), 281–287. doi:10.1016/j.psychres.2007.10.017

Walker, A. G., & Warren, A. R. (1995). The language of the child abuse interview: Asking the questions, understanding the answers. In T. Ney (Ed.), *True and false allegations of child sexual abuse: Assessment and case management* (pp. 153–162). New York:Brunner-Mazel. Retrieved from http://search.proquest.com/docview/618770360?accountid=14766

Walsh, W. A., Jones, L. M., Cross, T. P., & Lippert, T. (2008). Prosecuting child sexual abuse: The importance of evidence type. *Crime & Delinquency, 56*, 436-454.

White, L. R. (2013). The function of ethnicity, income level, and menstrual taboos in postmenarcheal adolescents' understanding of menarche and menstruation. *Sex Roles*, *68*(1–2), 65–76. doi:10.1007/s11199-012-0166-y

Young, M. D., Deardorff, J., Ozer, E., & Lahiff, M. (2011). Sexual abuse in childhood and adolescence and the risk of early pregnancy among women ages 18–22. *Journal of Adolescent Health*, *49*(3), 287–293. doi:10.1016/j.jadohealth.2010.12.019

Zumbo, B. D. (2007). Three generations of DIF analyses: Considering where it has been, where it is now, and where it is going. *Language Assessment Quarterly*, *4*(2), 223–233. doi:10.1080/15434300701375832