Child Abuse & Neglect xxx (2014) xxx–xxx

Contents lists available at ScienceDirect

Child Abuse & Neglect

Impact of telemedicine on the quality of forensic sexual abuse examinations in rural communities☆

Sheridan Miyamoto[a,*], Madan Dharmar[b], Cathy Boyle[c], Nikki H. Yang[d], Kristen MacLeod[e], Kristen Rogers[f], Thomas Nesbitt[g], James P. Marcin[b]

[a] Betty Irene Moore School of Nursing, University of California Davis, Sacramento, CA 95817, USA
[b] Department of Pediatrics, Center for Health and Technology, University of California Davis, 4610 X Street, Sacramento, CA 95817, USA
[c] Mark Twain Medical Center, Calaveras County SART Team, 768 Mountain Ranch Road, San Andreas, CA 95249, USA
[d] Center for Health and Technology, University of California Davis, 4610 X Street, Sacramento, CA 95817, USA
[e] Washoe County CARES Program, Northern Nevada Medical Center, 2375 E. Prater Way, Sparks, NV 89434, USA
[f] California Department of Public Health Maternal, Child & Adolescent Health Program, MS 8305, P.O. Box 997420, Sacramento, CA 95899-7420, USA
[g] Center for Health and Technology, Department of Family and Community Medicine, University of California Davis, 4610 X Street, Sacramento, CA 95817, USA

ARTICLE INFO

Article history:
Received 6 January 2014
Received in revised form 9 April 2014
Accepted 23 April 2014
Available online xxx

Keywords:
Telemedicine
Telehealth
Forensic nursing
Forensic medicine
Sexual abuse
Sexual assault
Sexual violence
Rural health
Quality of healthcare
Pediatrics

ABSTRACT

To assess the quality and diagnostic accuracy of pediatric sexual abuse forensic examinations conducted at rural hospitals with access to telemedicine compared with examinations conducted at similar hospitals without telemedicine support. Medical records of children less than 18 years of age referred for sexual abuse forensic examinations were reviewed at five rural hospitals with access to telemedicine consultations and three comparison hospitals with existing sexual abuse programs without telemedicine. Forensic examination quality and accuracy were independently evaluated by expert review of state mandated forensic reporting forms, photo/video documentation, and medical records using two structured implicit review instruments. Among the 183 patients included in the study, 101 (55.2%) children were evaluated at telemedicine hospitals and 82 (44.8%) were evaluated at comparison hospitals. Evaluation of state mandatory sexual abuse examination reporting forms demonstrated that hospitals with telemedicine had significantly higher quality scores in several domains including the general exam, the genital exam, documentation of examination findings, the overall assessment, and the summed total quality score ($p < 0.05$ for each). Evaluation of the photos/videos and medical records documenting the completeness and accuracy of the examinations demonstrated that hospitals with telemedicine also had significantly higher scores in several domains including photo/video quality, completeness of the examination, and the summed total completeness and accuracy

☆ This work was supported, in part, by grants from Maternal and Child Health Bureau of Health Resources and Services Administration (HRSA R40MC08723) and the William Randolph Hearst Foundation. The funding sponsors had no involvement in study design, collection, analysis, interpretation of the data, or writing the report, or the decision to submit the results of this work for publication.

* Corresponding author address: Betty Irene Moore School of Nursing, University of California Davis Health System, 4610 X street Suite 4202, Sacramento, CA 95817, USA.

http://dx.doi.org/10.1016/j.chiabu.2014.04.015

score ($p < 0.05$ for each). Rural hospitals using telemedicine for pediatric sexual abuse forensic examination consultations provided significantly higher quality evaluations, more complete examinations, and more accurate diagnoses than similar hospitals conducting examinations without telemedicine support.

Introduction

Child sexual abuse is a serious, underreported problem in the United States. In 2010, of 720,000 substantiated cases of child maltreatment, more than 66,000 children were victims of sexual abuse (U.S. Department of Health & Human Services, 2010). Interviews of adults suggest the incidence of sexual abuse in childhood is significantly higher, closer to 20% of girls and between 5% and 10% of boys (Finkelhor, 1994). When an allegation of child sexual abuse occurs, specialized training in interviewing, forensic evaluation, evidence collection, and diagnosis is necessary for the provision of quality care. Without this expertise, pediatric victims of sexual abuse may receive incomplete evaluations, inappropriate procedures, and inaccurate assessments. Anything short of a comprehensive evaluation and accurate diagnosis can result in serious ramifications for the investigation and the safety and protection of the child.

Rural communities providing services for child victims of sexual abuse face unique challenges due to disproportionately high rates of abuse (Menard & Ruback, 2003) likely stemming from issues of poverty, substance abuse, mental health issues, lower educational attainment as well as fewer resources to support families, all of which are linked to child maltreatment (Child Welfare Information Gateway, 2012; Sudol, 2009). Additionally, there are relatively few health care providers trained and experienced in this field and they often work within urban child advocacy centers or academic health centers (Paradise, Winter, Finkel, Berenson, & Beiser, 1999). Examiners working in rural communities typically do not treat a sufficient volume of patients to attain and retain proficiency and often work in relative isolation, leading to high rates of burnout (Townsend & Campbell, 2009). As a result, child victims in rural communities are less likely to receive comprehensive forensic examinations (Walsh, Cross, Jones, Simone, & Kolko, 2007) and are more likely to require transport to centers with child abuse expertise. The latter scenario can cause additional stress to the child and family and travel time may contribute to degradation of biologic evidence. Further, transporting children long distances to obtain specialty services contributes to increased costs incurred by counties and the overall healthcare system.

Telemedicine is increasingly used to overcome barriers and inequities in access to specialty services. Studies in a variety of clinical settings have demonstrated that telemedicine can increase the quality of care (Callahan, Malone, Estroff, & Person, 2005; Dharmar et al., 2013; Marcin et al., 2005; Rosenfeld et al., 2000), improve patient and provider satisfaction (Burton, Stanley, & Ireson, 2002; Dharmar et al., 2013; Marcin et al., 2004; Whitten & Love, 2005), and improve community members' perception of locally available care (Nesbitt, Marcin, Daschbach, & Cole, 2005). While it is not possible to have child sexual abuse specialists in every community, telemedicine allows specialists at regional centers to support less experienced examiners at a distance. We previously demonstrated positive changes in the completeness of sexual abuse examinations when rural examiners were supported by specialists through telemedicine consultations (MacLeod et al., 2009). Building on the findings from this work, we sought to evaluate the impact of a telemedicine-based consultation program on the quality and accuracy of child sexual abuse examinations in rural communities. The first aim of the study was to determine the quality of care provided by evaluating the State of California's Office of Emergency Services (OES) mandatory sexual abuse examination forms completed by providers at the time of the forensic examination. The second aim was to evaluate and compare the completeness of the forensic examinations and the accuracy of the final diagnosis. We hypothesized that examinations conducted at hospitals with telemedicine would result in higher quality OES evaluations and more complete and accurate diagnostic findings compared to examinations conducted at similar rural hospitals, without telemedicine support.

Methods

Study Design

A retrospective review of child sexual abuse forensic examinations was conducted at eight rural hospitals in Northern California. Five of the hospitals had access to telemedicine to obtain expert consultations during forensic examinations and three hospitals did not. Of the five telemedicine hospitals, four did not have an existing child abuse program prior to the installation of telemedicine and one had an established program, yet relatively inexperienced examiners, most having conducted fewer than 10 examinations on children. All three comparison hospitals had longstanding child sexual abuse programs and functioned independently without external support.

Telemedicine and comparison hospitals are all located in designated rural areas (Office of Statewide Health Planning and Development (OSHPD), 2014) and provide care to underserved communities (U.S. Department of Health and Human Services & Health Resources and Services Administration (HRSA), 2013). A variety of providers conducted sexual abuse examinations including registered nurses, physician assistants, nurse practitioners, and physicians. All providers were required to attend pediatric sexual abuse examiner training through the academic medical center's forensic training center.

Please cite this article in press as: Miyamoto, S., et al. Impact of telemedicine on the quality of forensic sexual abuse examinations in rural communities. *Child Abuse & Neglect* (2014), http://dx.doi.org/10.1016/j.chiabu.2014.04.015