Published in final edited form as:

Issues Ment Health Nurs. 2012 December ; 33(12): 882–896. doi:10.3109/01612840.2012.731136.

Comprehensive care and pregnancy: The unmet care needs of pregnant women with a history of rape

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Abstract

This paper proposes a framework for assessing the unmet needs of rape survivors during pregnancy based on the Sexual Assault Nurse Examiner (SANE) practice level theory and an empirical exploration of rape survivors' health status in pregnancy via a secondary analysis. Our findings indicate that there may be unmet needs in pregnancy related to all five post-assault comprehensive care components: (1) physical care, (2) pregnancy prevention, (3) sexually transmitted infection screening, (4) psychological care, and (5) legal care. Rape history and its current impact on the survivor predicted somatic disorders, substance use, unwanted pregnancy, infections, posttraumatic stress disorder, and recent abuse.

Recent research is underscoring pregnancy as a time when past violent victimization and posttraumatic stress can affect both the woman's maternity care experience and outcomes (Söderquist, Wijma, Thorbert, & Wijma, 2009; Seng, Kane Low, Sperlich, Ronis, & Liberzon, 2011). In order to explore the effects of past sexual trauma in pregnancy, it is essential to understand the post-assault care survivors are receiving. Sexual assault nurse examiner (SANE) services represent a standard for comprehensive post-assault care and are designed to address the immediate needs of the survivor and prevention of sequelae (Ledray, 1999). However, not all survivors pursue or receive SANE services, which creates the possibility of unmet needs in health status. Long-term mental and physical health status, as well as safety status, are more compromised among rape survivors generally (Resnick, Acierno, & Kilpatrick, 1997) and there is the potential for these decrements to continue into pregnancy. There has been limited research on the health status of adult and childhood rape survivors as they enter pregnancy. It seems likely that rape survivors could have unmet mental, physical, and safety needs that should be addressed by tailored maternity care that

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^aSupport to Michelle Munro was provided by the Midwest Nursing Research Society and Council for the Advancement of Nursing Science Dissertation Grant, the Rho Chapter Sigma Theta Tau International Research Award, and the National Institutes of Health, National Institutes for Nursing Research grant number 1F31NR012852-01.

^bThis study was funded by the National Institutes of Health, National Institute for Nursing Research grant number NR008767 (Seng, PI), "Psychobiology of PTSD & Adverse Outcomes of Childbearing." The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute of Nursing Research or the National Institutes of Health.

considers their survivor status. Practice level theory and an evidence base demonstrating unmet needs in relation to the theory would be useful to guide trauma-informed maternity care for sexual assault survivors. The SANE guidelines are evidence-based. They have become the basis for protocol development and are a *de facto* practice level theory. Walker and Avant (1998) define practice level theory as having a “desired goal and prescriptions for action to achieve the goal” (p. 14). SANE’s use the components of this practice level theory to guide care to address the gamut of survivor needs in the acute post-assault period. However, we are lacking an organizing framework for survivor needs after the acute post-assault period. Using the same five components of the SANE guidelines (Table 1) has the potential to provide a comprehensive organizing framework for research and to serve as practice level theory to guide clinician thinking on long-term outcomes consistent with the notion that unmet needs in the acute period can become chronic concerns.

Thus, the purpose of this paper is to assess the proposed comprehensive care framework’s utility at predicting areas of unmet needs in survivors after the acute period. Specifically, we will use secondary analysis of a perinatal database to test the hypothesis that rape survivors’ have decrements in their health status in pregnancy consistent with a pattern of unmet needs in the five components outlined by the SANE guidelines. The hypothesis arises from the assumption that not all sexual assault survivors received comprehensive care in the acute post-assault period.

A Practice Level Theory Based on SANE Protocols

Research has established that survivors of rape have significant physical and mental health consequences post-assault. Advances in providing evidence-based care to rape survivors that have grown out of this research include SANE services to treat and prevent post-assault sequelae. According to Ledray (1994; 1999), the role of the SANE includes providing care using a protocol that includes five components of comprehensive care 1) treatment of physical injuries and anticipatory guidance about somatic distress (e.g. headache, nausea, sleeplessness, and pain) as outlined by Burgess and Holmstrom (1974), 2) evaluation and treatment of sexually transmitted infections (STIs), 3) pregnancy evaluation and prevention, 4) crisis intervention and counseling for mental health, and 5) the collection of forensic evidence and establishing a connection with victim services. These SANE practice goals function as a proposed standard of comprehensive care services post-assault. This set of five evidence-based components is thus useful as a practice level theory, an organizing framework via which to look for potential unmet needs in prenatal health status among past survivors of sexual assault. Even though the services provided by SANE nurses are not available at all locations where sexual assault survivors may pursue care or even utilized by all survivors, these five components of comprehensive care still represent the standard of post-assault care that nurses should strive to provide (World Health Organization & United Nations High Commissioner for Refugees, 2004). Table 1 integrates the SANE goals with the five comprehensive care components and their conceptual definitions then links these to how they are operationalized in the database analyzed below.

Background

Because our focus is on the five components of care that include STI prevention and pregnancy prevention, our literature review focused on papers with the narrow definition of completed rape, as opposed to the broad spectrum of sexual assaults. We included only studies that focused on pregnancy using the keywords sexual abuse or rape or sexual assault or intimate partner violence and each of the five components of comprehensive care (i.e., substance abuse, prenatal care, pregnancy wantedness, sexually transmitted diseases, mental health, and quality of relationships and/or interpersonal violence). There were 11 articles

that provide background information tightly related to our research question, which is “Do rape survivors have decrements in mental health, physical health, and safety status, or unmet needs in these domains in future pregnancies?” We summarize these papers in relation to the comprehensive care framework in Table 2. The samples from the studies were obtained from diverse settings, including an emergency department, midwifery practices, an alternative high school, and a mental health clinic. Three main findings emerged across these papers: 1) There is evidence of unmet needs for comprehensive care among survivors going into pregnancy; 2) There is evidence of adverse pregnancy outcomes that may warrant trauma-informed tailored prenatal care; and 3) There is variance between trauma severity and outcomes.

First of all, there were several studies that identified unmet needs for comprehensive care in the antenatal period as evidenced by impaired physical health status, substance use, increased rates of infection, higher rates of pregnancy unwantedness, adverse mental health outcomes, and the potential for revictimization in pregnancy. Few studies focused on physical health status going into pregnancy, but there were two that found a higher pre-pregnancy body mass index (BMI) (Lukasse et al., 2009; Nerum et al., 2009). This could indicate a decrement in health status since being overweight in youth is associated with obesity in older adulthood and since maternal obesity in pregnancy is associated with adverse pregnancy outcomes such as gestational hypertension, gestational diabetes, preeclampsia, macrosomia, congenital anomalies, and cesarean section (Davies et al., 2010; Yazdani, Yosofniyapasha, Nasab, Mojaveri, & Bouzari, 2012). Past research in the clinical and epidemiological literature (Eberhard-Gran, Schei, & Eskid, 2007; Goldring, Stein, Siegel, Burnam, & Sorensen, 1988; Seng, Clark, McCarthy, & Ronis, 2006) has also identified higher rates of somatic complaints in survivors of sexual assault such as headache, sleep disturbances, and nausea. There were two studies that noted somatic disturbances among sexual assault survivors such as pelvic pain (Van der Hulst et al., 2006) and an increase in common pregnancy complaints including such somatic problems as headache, nausea, and tiredness (Lukasse et al., 2009). There was a correlation between rape and cigarette use and alcohol consumption during pregnancy (Leonardson et al. 2003; Lukasse et al., 2009; Nelson et al., 2010; Van der Hulst et al., 2006). Additionally, three studies found increased rates of infection including bacterial vaginosis, Chlamydia, gonorrhea, and trichomoniasis in pregnant survivors of rape and sexual violence (Lukasse et al., 2009; McFarlane, 2007; Nelson et al., 2010). Three studies also demonstrated a higher incidence of unwantedness in pregnancies that were the direct result of a rape, leading to higher numbers of elective abortions, spontaneous abortions, and adoptions (Holmes et al., 1996; McFarlane, 2007; Nerum et al., 2009). One study also used hazard analyses to demonstrate that women who experience sexual abuse in childhood and adolescence are at increased risk of early pregnancy, or a pregnancy that occurs in adolescence (Young, Deardorff, Ozer, & Lahiff, 2011). However, the strongest and most consistent associations were found between rape history and increased rates of depression including post-partum depression, stress, anxiety, mental distress, and PTSD (Eberhard-Gran et al., 2008; Garabedian, Lain, Hansen, Garcia, Williams, & Crofford, 2011; Holmes et al., 1996; Lukasse et al., 2009; Nelson et al., 2010; Osborne et al., 2001; Van der Hulst et al., 2006). One study also considered the association of rape with intimate partner violence, taking into consideration the concept of revictimization (McFarlane, 2007). Low sociodemographic status is both a risk factor for and an outcome of sexual trauma. The majority of the 11 studies noted a higher prevalence of women who were young, poor, less educated, and minorities among participants in these pregnancy studies who were rape survivors (Nelson et al., 2010; Leonardson et al., 2003; Lukasse et al., 2009; Nerum et al., 2009; Osbourne et al., 2001; Van der Hulst et al., 2006; Young, et al., 2011). These findings from the literature are consistently showing decrements in the health status of survivors or unmet needs in relation to the five components of comprehensive care.

Additional findings emerged that were unrelated to the current purpose of validating the comprehensive care model as a framework. However, these findings are important to consider in relation to maternity services for survivors more broadly and we summarize them here. These include emotional implications and birth outcomes. Women forced to have sex before the age of 16 were found to have fewer people to help them in times of need and to have decreased levels of optimism (Nelson et al., 2010). Women who had experienced a sexual assault reported more internal beliefs concerning their health locus of control, higher levels of conflicted feelings about sexuality, and increased levels of autonomy (Van der Hulst et al., 2006). Increased levels of fear about labor and delivery also were found among women with a previous history of sexual violence and abuse (Eberhard-Gran et al., 2008; Lukasse et al., 2009). Several of the studies found less well-being and increased labor complications in the rape survivor group (Eberhard-Gran et al., 2008; Nerum et al., 2009; Van der Hulst et al., 2006). There was also an increase in the rates of cesarean sections and operative vaginal deliveries, as well as a longer second stage of labor among rape survivors (Nerum et al., 2009; Van der Hulst et al., 2006).

A factor that also emerges from the literature is that there is a range of risk and resilience for long-term problems among rape survivors. A certain proportion are resilient, meaning they had endured a traumatic event but had not developed PTSD, while others have had their needs fully met at the time of the trauma. Studies point out the need to individualize assessment and to offer interventions commensurate with severity of sequelae at the time of pregnancy (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). The studies reviewed here identified a number of sequelae related to the patient's personal history and their current socioeconomic status, suggesting that the assault itself, contextual factors, and sequelae all may contribute to adverse outcomes. Additionally, a number of the studies lacked a specific description of the duration, severity, or circumstances associated with the rape or past sexual abuse (Lukasse et al., 2009; Nelson et al., 2010; Osbourne et al., 2001; Van der Hulst et al., 2006). Lack of severity measures or specific definitions of rape and health outcomes in past research may have led to an underestimation of the impact of past sexual victimization on current pregnancy outcomes. These authors discuss the need for prospectively designed studies that offer a comprehensive assessment of these factors.

A final factor that emerges from a few of the studies is consideration of a life course perspective, looking at outcomes measured based on the timing of sexual assault by comparing whether it occurred in childhood or adulthood (Garabedian et al., 2011; Young et al., 2011). These results indicate that women raped in childhood had unmet needs in pregnancy prevention as evidenced by early pregnancies and mental health outcomes related to the timing of the assault (Nelson et al., 2010; Young et al., 2011). These studies indicated that the timing of sexual assault in the survivor's life course may therefore impact the occurrence of future assault, or revictimization, as well as the physical and mental health status of the survivor.

To summarize, the literature reviewed here provides support for the notion that some rape survivors have unmet needs during all phases of pregnancy when compared to women without a history of rape. Specifically, completed rape survivors were more likely to have unmet needs in relation to the following components of comprehensive care due to their increased risk within each category: 1) physical care that could incorporate such aspects as higher BMI's, more somatic disturbances, and increased substance abuse during pregnancy, 2) pregnancy prevention including higher rates of elective and spontaneous abortions and unwanted or unplanned pregnancies from a rape-related pregnancy as well as a higher risk of early pregnancies, 3) STI screening that included increased rates of gonorrhea, Chlamydia, trichomoniasis, and urinary tract infections, 4) psychological disturbances such

as depression, anxiety, and/or posttraumatic stress disorder, and 5) legal and safety concerns in connection with current experiences of interpersonal violence (Table 2).

Methods

We conducted a secondary analysis to provide an empirical basis for trauma-informed maternity care that tests the hypothesis that post-assault survivors entering prenatal care are more likely to have unmet needs in health status across the five comprehensive care components. Our analysis will take into account the two additional factors supported by the literature retrieved. We will attend to assault severity by focusing on cases of completed rape (i.e., involving penetration) and by modeling the subjective impact at the time of the trauma and over the last year. The analysis will also compare the effect of assault early in the life course (<16 years of age) versus in adulthood. Thus, the goal of this analysis is to consider within a single study all of these identified factors.

Design

This is a secondary analysis of a prospective three-cohort study that was designed to determine the effects of PTSD on pregnancy outcomes among diverse nulliparous women (NIH R01 NR008767, PI Seng). The data utilized for this analysis are from women enrolled for follow-up via diagnostic structured interviews in early pregnancy (n=1,049) who had prenatal chart data (n=947).

Recruitment and Procedures

Recruitment occurred at maternity clinics in three health systems in the Midwestern United States. Eligibility was determined by obstetric clinic nurses based on 1) being 18 or older, 2) expecting a first infant, 3) able to speak English without an interpreter, and 4) initiating prenatal care at less than 28 weeks gestation. Eligible women were invited to participate in a telephone survey about “stressful things that happen to women, emotions, and pregnancy.” The surveys were conducted by a survey research organization (DataStat, Ann Arbor, Michigan) using a computer-assisted telephone interview (CATI) program to conduct a standardized psychiatric diagnostic interview designed for use with lay interviewers. The interviews took place from August 2005 through October 2007. All interviews began by confirming eligibility and obtaining a verbal informed consent including an explanation of the Confidentiality Certificate protections. Institutional Review Board approvals were obtained from all three health systems where recruitment took place.

Chart review was conducted on two sites’ paper charts using a standardized chart abstraction form. Reliability was established early in the project by training, creating decision tools, and revising the form until inter-rater agreement reached 92.7% (Seng, Mugisha, & Miller, 2008). A five percent audit over the life of the project resulted in 94.4% agreement, which is considered excellent reliability (Waltz, Strickland, & Lenz, 1991). The third site used an electronic medical record. Items were extracted, downloaded and transformed to a flat spreadsheet for cleaning and recoding in SPSS. Manual reading of individual patient electronic medical records was done to redress errors in original data entries, such as data missing by being entered in the wrong field by the clinician.

PTSD Diagnosis and Cohort Assignment

Posttraumatic stress disorder diagnosis was determined in accordance with the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition* (DSM-IV; American Psychiatric Association, 1994). Women were assigned to one of three cohorts for follow-up: lifetime PTSD-diagnosed cases, trauma-exposed but resilient controls that did not develop PTSD, and non-exposed controls. Women not meeting any cohort definition, usually due to having

partial PTSD, were not enrolled for follow-up and thus were not included in these analyses. For the purposes of this analysis, the PTSD-diagnosed cohort was divided to distinguish those who met diagnostic criteria for PTSD currently and those with a lifetime history of PTSD who no longer met diagnostic criteria, resulting in four groups for analysis: 1) current PTSD, 2) lifetime PTSD, 3) non-exposed, and 4) trauma-exposed, resilient.

Rape Survivor Classification

Participants were classified as rape survivors if they answered yes to either or both of the following items: “Before age 16, did you ever have oral, anal, or genital sex when you didn’t want to because someone forced or manipulated you in some way or threatened to harm you if you didn’t? And what about after age 16?” There are three mutually exclusive grouping possibilities: childhood-only rape, adult-only rape, and both childhood and adult rape. We expect the number in the last category to be small. Because the sequelae of childhood rape are so severe, we expect women with a history of rape across both periods in the life course to have characteristics more closely resembling childhood rape survivors and so we will place them in that category.

Measures

The study used well-established measures, which have previously been described in detail (Seng et al., 2009). We will briefly review the instruments used to collect the data pertinent to this secondary analysis. The Centers for Disease Control’s Perinatal Risk Assessment Monitoring Survey (PRAMS) was used to assess the demographic characteristics of the sample, substance use, and pregnancy wantedness (Gilbert, Johnson, Morrow, Gaffield, & Ahluwalia, 1999). In order to assess the negative outcomes in comprehensive care among rape survivors, pregnancy wantedness was reverse coded to capture pregnancy *unwantedness*. A dichotomous variable was created to designate any substance use in pregnancy including any tobacco use, illicit drugs, and/or one or more alcoholic drinks per week. The parent study used a five-factor risk index to model sociodemographic status in relation to PTSD (Seng, Low, Sperlich, Ronis, & Liberzon, 2009). These risk factors include being African American, a teenager (18–20 years in this study), living in poverty (< \$15,000), having a secondary education or less, or living in a neighborhood with a higher crime rate than the United States average (Brewin, Andrews, & Valentine, 2000). The high crime neighborhood variable was computed by using zip codes and the Federal Bureau of Investigation 2000 average crime rates (simplymaps.com, retrieved May 20, 2009) to code individuals as living in a zip code with a rate higher or lower than the United States average. These risk factors were also summed to create an index of high socioeconomic (SES) risk (0–5), which we used in a nominal form where 0 or 1 is low risk and 2 or more is high SES risk (Sameroff & Rosenblum, 2006; Seng et al., 2009). The Life Stressor Checklist is a behaviorally specific questionnaire that uses nonlegal language to assess for 29 potentially traumatic events using “yes or no” questions (Wolfe & Kimmerling, 1997). The elicited traumatic events are then assessed for whether or not the exposure met the DSM-IV criteria including whether the participant felt fear, helplessness, or horror. After the participant’s list of exposures is generated, she is then asked to indicate her first- and second-worst trauma exposures, more in-depth questioning then determines the age at which these “index” trauma exposures occurred and the impact on the woman’s life at the time, rated as 1= no impact, 2= moderate impact, 3= extreme impact, followed by the impact over the last year rated on the same scale. For every woman who reported index trauma exposures, we reduced data by creating a sum of the impact scores for both index exposures at the time of the trauma and over the last year. Because not all women report an index trauma in their lifetime, some impact scores are zero. The impact scores only refer to sexual assault if that was an index trauma. The Abuse Assessment Screen (AAS) was used to determine intimate partner violence occurring in the past year (McFarlane, Parker, Soeken, & Bullock, 1992). The

National Women's Study PTSD Module (NWS-PTSD) is a version of the Diagnostic Interview Schedule that was previously used by the National Crime Victim Center to assess for PTSD in an epidemiological study of women. It is designed as a structured telephone diagnostic interview that can be administered by lay interviewers and has demonstrated adequate sensitivity (0.99) and specificity (0.79) in past studies when compared to the Structured Clinical Interview for DSM Disorders (Kilpatrick et al., 1994; Resnick et al., 1993). The Pregnancy-Unique Quantification of Emesis and Nausea (PUQE) was used to measure nausea and vomiting in pregnancy (Koren et al., 2002). For the purposes of this analysis, we looked at moderate symptoms (PUQE score of 7–12) and severe symptoms (PUQE score of 13–15) (Koren et al., 2002). Additionally, due to the absence of a variable that specifically assessed for physical health status or physical distress, a dichotomous variable was created that identified the presence of either a pre-existing chronic condition per self-report in the prenatal medical history or the presence of moderate to severe symptoms on the PUQE survey. The presence of any infections in pregnancy was obtained from the chart and included any prenatal incidence of HIV, Chlamydia, gonorrhea, syphilis, herpes, condyloma, trichomoniasis, yeast, bacteria vaginosis, Group B Streptococcus (GBS), or urinary tract infections. These dichotomized variables are used in the analysis as proxies for evidence of unmet needs in relation to the components of comprehensive care depicted in Table 1.

Data Analyses

Data analysis began with an evaluation of descriptive characteristics of the sample including demographics, rape history and classification into adult and child survivor groups, and characterization of the overall trauma history. Bivariate analyses were used to examine comprehensive care outcomes among groups. This analysis compares rape survivors with non-survivors and considers whether childhood rape survivors have an increased number or risk of unmet needs in pregnancy when compared to adult rape survivors. In addition to these comparisons, we present a series of regression models. The first set organizes the analysis with the practice level theory, defining the five components of comprehensive care as six dependent variables. Specifically, the dependent variables in this analysis are proxies for unmet care needs in physical care, sexually transmitted infection occurrence, pregnancy unwantedness, psychological care, and safety in subsequent pregnancies. The predictor variables are rape status, impact at the time of the trauma, impact over the last year, and finally the models adjust for cumulative sociodemographic stress. Taking into consideration the effect of the trauma's past year impact and past literature on the mediating effects of PTSD, it also seemed important to assess PTSD as a predictor of comprehensive care outcomes, instead of as an outcome itself. In a second set of models, we also assess the extent to which posttraumatic stress is a better predictor of decrements in health status or unmet needs than rape itself. All analyses were conducted in IBM Statistical Package for the Social Sciences 19.0 (SPSS, Inc., Chicago, IL.). All p-values were two-tailed and the level of significance was $<.05$.

Results

Classification of Completed Rape

The sample of 947 women included 107 disclosures of childhood or adult rape by 99 (10.5%) of the study participants. Forty-two women were adult-only rape survivors (were raped at age 16 or older). Forty-nine women were childhood-only rape survivors (were raped while under the age of 16). Eight women were survivors of both childhood and adult rape. As explained above, those eight women who were raped in both periods of the life course are grouped with the childhood raped survivors ($n=57$). This study demonstrated that

childhood rape posed a 3.3 times increased risk for being raped again as an adult ($\chi^2=9.3$, $df=1$, $p=.002$).

Demographics

The sample of 99 rape survivors ranged in age from 18–42 years (mean=25.6) at the time of the study interview. The sample was racially and ethnically diverse with three women who reported their ethnicity to be Latina and three women who reported a Middle Eastern ethnicity. Racial demographics consisted of 55 African American/Black women, 41 European American/White, one Asian, one Native Hawaiian/Pacific Islander, and one American Indian/Alaska Native. Finally, the majority of the sample (60%) reported being currently employed, while 26.3% reported being unemployed, 16% reported being a full or part-time student, and 3% reported being a homemaker. Table 3 describes the total sample and provides a comparison of rape survivors ($n=99$) and non-survivors ($n=848$) as well as adult rape survivors ($n=42$) and child rape survivors ($n=57$) on the five key sociodemographic risk factors linked to PTSD and the trauma variables assessed in this study.

Attrition Analyses

This sample of women is the subset of the 1,049 women enrolled for follow-up who have prenatal chart data. The sample used for this analysis ($n=947$) did not differ significantly ($\chi^2=.100$, $df=1$, $p=.751$) from the enrolled sample in terms of the proportion with high socioeconomic risk status (defined as two or more risk factors). The proportion of rape survivors in this analysis sample was not significantly different from the proportion originally enrolled ($\chi^2=.326$, $df=1$, $p=.568$).

Characterization of the Trauma

Of the 99 survivors, 45 reported that rape was their index trauma, or first- or second-worst life trauma. At the time of the trauma, among participants who rated rape as their index trauma, three reported no impact, 11 reported moderate impact, 30 reported an extreme impact, and one participant who rated a childhood and adult rape as her first- and second-worst traumas rated both as having an extreme impact. When recording the current impact of the trauma, six reported no impact, 11 reported moderate impact, 27 reported extreme impact, and the one participant who rated a childhood and adult rape as her first- and second-worst traumas rated both as having a moderate impact on her over the last year.

As noted in Table 3, rape survivors had significantly higher ratings of the impact at the time of the trauma with a mean rating of 5.41 ($SD=.88$) versus 3.81 ($SD=2.32$) for those who were not rape survivors ($t(297.71)=12.83$, $p<.001$). Rape survivors also demonstrated a statistically significant difference in their report of the last year trauma impact with a mean score of 3.96 ($SD=1.25$) versus 2.43 ($SD=1.67$) when compared to non-survivors ($t(142.40)=11.03$, $p<.001$). No significant differences were noted between adult and childhood rape survivors on the variables of impact at the time of the trauma or last year trauma impact.

PTSD Rates

The outcomes of the 99 rape survivors in terms of PTSD were as follows: 2% disclosed that rape occurred but did not report the fear, helplessness, and horror criterion for trauma-exposure, 21% did meet the criteria but were resilient and had not developed PTSD, 38% had recovered from lifetime PTSD, and 38% were affected with current PTSD. Additional analyses revealed that there were no significant differences between adult and childhood rape survivors in lifetime PTSD (35.7% vs. 40.4%) or current PTSD (31.0% vs. 43.9%).

However, posttraumatic stress disorder rates varied based on rape status and number of lifetime traumas. When compared to non-survivors, rape survivors demonstrated higher rates for current PTSD (9.3% vs. 38.4%) and lifetime PTSD (16.2% vs. 38.4%). Additionally, about 15% more of the non-survivors were trauma resilient, meaning they had endured a traumatic event but had not developed PTSD.

Comprehensive Care Outcomes

Table 4 depicts the comprehensive care outcomes of childhood rape survivors, adult rape survivors, and non-survivors. Bivariate analyses revealed that rape survivors had significantly higher rates of unmet care needs in 1) physical health status as identified by pre-existing chronic conditions and/or moderate to severe PUQE scores and any substance use in pregnancy, 2) STI screening as measured by the presence of any infection in pregnancy, 3) psychological care or the presence of current PTSD, and 4) legal/safety as recognized by current physical or sexual abuse. There were no significant differences among groups in pregnancy unwantedness. In fact, all three groups reported similar rates (50%) of pregnancy unwantedness, which is consistent with the literature on planned pregnancies (Finer & Kort, 2011). If we corrected the level of significance by Bonferroni's method for the six hypothesis tests, or six outcomes of the practice level theory, then the significant outcomes are 1) physical care as evidenced by any substance use, 2) psychological care or the presence of current PTSD, and 3) legal/safety as recognized by current physical or sexual abuse ($p < .008$ correcting for six tests). The results also indicate that the outcomes differ slightly by adult or childhood exposure. Adult-only rape survivors had higher percentages of chronic diseases and/or moderate to severe PUQE scores while childhood rape survivors demonstrated higher percentages of substance abuse in pregnancy.

Comprehensive Care Outcomes Modeling

In order to assess the trauma variables that predicted poor outcomes for comprehensive care, we modeled rape status as the first step, trauma impact at the time of the trauma and trauma impact over the last year as the second step, and adjusted for sociodemographic risk factors as the final step in the models for all six comprehensive care outcomes. This model, as depicted in Table 5, revealed that of the six outcomes, rape status significantly predicts five outcomes including chronic conditions (1% of variance), substance use (1% of variance), infections (1% of variance), mental health (7% of variance), and current abuse (10% of variance). Impact at the time of the trauma exposure is significantly predictive for chronic conditions only. Last year impact is significantly predictive of all six outcomes, even when the rape itself was not independently predictive. However, the strongest association with last year impact was with the mental health outcome, explaining 29% additional variance. Taking socioeconomic risk into account showed different patterns across all six outcomes. Socioeconomic risk contributed a small amount of variance to substance use (1%), mental health (1%), and current abuse (9%). When socioeconomic risk was taken into account in relation to chronic conditions the impact variables were no longer independently predictive and socioeconomic risk explained an additional 9% of variance. Finally, socioeconomic status became the only significant predictor in relation to pregnancy unwantedness and infection.

Table 6 depicts the final model using rape status, PTSD status, and sociodemographic status to predict the comprehensive care outcomes of physical care, pregnancy prevention, infection prevention, and legal/safety. Rape status alone significantly predicts chronic conditions (1% of variance), any substance use (1% of variance), any infection (1% of variance), and current abuse (10% of variance). Posttraumatic stress disorder independently predicts all outcomes except chronic conditions, mediating the relationship of rape history with substance use and infection and moderating the association with current abuse.

Posttraumatic stress disorder also significantly predicts pregnancy unwantedness (18% of variance). Taking socioeconomic risk into account again shows a different pattern across the five outcomes contributing little effect to chronic condition status, an additive effect with substance use (1%) and current abuse (9%), and it becomes the only significant predictor in relation to pregnancy unwantedness (adding 20% variance) and infection (adding 29% variance).

These analyses demonstrate that posttraumatic stress disorder and subjective reports of severity as seen in the last year's impact are essentially proxies for each other. Both variables have significant impact on the overall models. Rape status itself remains independently predictive of somatic distress as measured by chronic conditions and/or a moderate to severe PUQE score, substance use, infections, mental health, and current abuse. However, substance use is better explained by the last year trauma impact or PTSD. Finally, pregnancy unwantedness and the presence of infection seem to be much more strongly related to the woman's socioeconomic status.

Discussion

Examination of the theory, literature, and this empirical analysis together provide evidence of the five components of comprehensive care as a useful practice-level theory to guide assessment of unmet needs in pregnancy. This integrated study found that there may be unmet needs in pregnancy related to all five components of comprehensive care including 1) physical care, 2) pregnancy prevention, 3) STI screening, 4) psychological care, and 5) legal care. Infection in pregnancy and pregnancy unwantedness appear mainly to be a factor for disadvantaged women as characterized by sociodemographic status. Posttraumatic stress disorder was apparent as not only an outcome but also a predictor of substance use, pregnancy unwantedness, infections, and current abuse. The analyses also suggested that women raped in childhood are at an increased risk for substance use in pregnancy. However, overall the unmet needs for comprehensive post-assault care among pregnant women did not differ dramatically based on the timeframe of the life course in which the trauma occurred.

These results are consistent with past work that has identified higher rates of tobacco use in pregnancy among women with PTSD and trauma history (Lopez, Konrath, & Seng, 2011), higher rates of infection among those who have survived sexual victimization (Lukasse et al., 2009; McFarlane, 2007; Nelson et al., 2010) increased depressive symptoms in pregnancy among those who have survived past sexual assault (Söderquist et al., 2009), and higher rates of future abuse, or revictimization, among those who have survived a sexual trauma (Messman-Moore & Long, 2000).

An additional finding was the higher rates of infection among rape survivors in pregnancy, especially in those with PTSD. This increased risk of infection may be related to more sexual contacts (as noted by Wingood & DiClemente, 1998) or potentially from PTSD's impact on the immune system. Past work by Altemus, Cloitre, and Dhabar (2003) has found that increased cell-mediated inflammatory reactions are greater in individuals with PTSD, which may influence the acquisition or persistence of infection among pregnant women with PTSD.

Adult rape survivors and those with a high impact rating at the time of the trauma and over the last year demonstrated higher rates of pre-existing chronic conditions and/or moderate to severe PUQE scores. This study also identified that rape survivors had higher rates of these somatic disturbances. Post-hoc analysis of greater detail showed generally higher rates across *International Classification of Diseases, 9th Revision* (ICD-9; 2005) system categories (Figure 1). This clinical research finding is consistent with empirical findings of

functional pain diagnoses among women with emergency room visits for rape and battering where the associations were generally mediated by mental health sequelae (Seng et al., 2006).

Comprehensive psychological assessment of pregnant women therefore has the potential to lend itself to improved pregnancy outcomes. Women with PTSD are at greater risk for adverse outcomes including preterm delivery (Rogal, Poschman, Belanger, Howell, Smith, Medina, & Yonkers, 2007), low birth weight (Seng, Kane Low, Sperlich, Ronis, & Liberzon, 2011), and increased anxiety related to labor (Söderquist et al., 2009). This is consistent with the results of the integrative literature review that identified adverse pregnancy outcomes related to a history of rape. By improving comprehensive care during pregnancy in order to meet the unique needs of rape survivors, we may be able to improve the adverse outcomes occurring during pregnancy and the postpartum.

Limitations to keep in mind arise primarily from the nature of secondary analysis. First, the variables used in this analysis were proxies that may not have accurately captured all of the components of comprehensive care. Additionally, the unstructured clinical questionnaire that captured the variable of pre-existing chronic conditions may not have captured all occurrences of this variable due to underreporting. Original data collection could have provided more accurate variables with which to assess all components of comprehensive care.

There also are strengths to this manuscript, which are adequate to support changes in practice. First, this secondary analysis utilized a large pregnancy database specifically designed to evaluate the effects of trauma in pregnancy. Second, the purpose of this research project was theory-driven and innovatively combined practice level theory, an integrative review of the literature, and empirical exploration. The theoretical framework and literature review guided data analysis and interpretation of results, thus contributing to the application of the results in practice and research.

Implications for future research include a need for studies of somatic distress among post-assault survivors and how those disorders may influence pregnancy outcomes. Additionally, this analysis did not explore pregnancy outcomes; therefore future analyses should focus on the relationship of past sexual trauma and pregnancy outcomes within the framework of comprehensive care.

The implications for clinical practice follow logically from these concerted pieces of evidence. First, it is essential that we consider new models of antenatal care that are trauma-informed and will therefore meet the distinct needs and desires of those who have survived a sexual trauma and may or may not be affected by PTSD. However, in order to provide trauma-informed prenatal care we must also be able to assess for a sexual trauma. This may involve using simple screening questions or a screening tool like the Prenatal Event History Calendar (Munro, Dahlem, Lori, & Martyn, 2012) that captures the contextual factors of a recent trauma or could capture life course events as well as a measure to diagnose and capture the symptoms of PTSD such as the PTSD Checklist (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993). Past work on comprehensive care models for the vulnerable population of substance abusing pregnant women have demonstrated positive outcomes (Jansson et al., 1996). It is therefore feasible to consider a model for comprehensive prenatal care that would address the specific needs of the vulnerable population of pregnant sexual assault survivors.

Second, it is also important to consider the care women are receiving at the time of a sexual trauma. This may include evaluating whether or not rape survivors are aware of their options for comprehensive care. Additionally, it is crucial to investigate how survivors are accessing

care and how they desire to access care. This may include considering whether rape survivors are accessing over-the-counter options for post-assault care such as emergency contraception. And if they are accessing these options, are they also investigating what other forms of care are available? There may be situations where sexual assault survivors have purposely not pursued all components of comprehensive care but might now be open to addressing resulting unmet needs.

The clinical evidence base would benefit from additional research. In the meantime, evidence based principles articulate a trajectory of providing care using available evidence even if it is limited to anecdotal reports and expert opinion (Rice, 2008). Clinicians are first encouraged to seek the highest level of evidence available to them (Rice, 2011). Then, individual clinicians can use an informed consent process with clients to explain what is known and to arrive at a tailored plan of care that is consistent with the client's personal beliefs and contextual factors (Rice, 2011). The concepts of 'missed opportunities for care' and 'catch-up care' may be very applicable in this situation (Munro, 2012). This comprehensive care framework can therefore serve as a guide for assessment and determining what 'catch up care' may be necessary for pregnant women with a history of rape either because they never received this care or because they continue to have unmet needs. Thus, the framework explicated in this manuscript indicates that there are potential missed opportunities for providing survivors comprehensive care in the antenatal period by neglecting to assess trauma history (Munro, 2012).

Conclusion

Results of this analysis suggest that this practice level theory is useful for organizing research and likely also clinical practice related to rape survivors long-term health status when there have been unmet needs for comprehensive care post-assault. The empirical validation of the value of this theoretical framing had findings within a single study that were consistent with results of findings previously spread across multiple studies. Our findings affirmed that the five elements of comprehensive care described in the SANE model are germane to survivors' antepartum health status. We found evidence that some rape survivors' health and safety status in pregnancy is compromised in a pattern indicative of unmet post-assault needs across all five categories. Unmet needs were most pronounced in relation to PTSD and among survivors who reported a high impact of the assault on their lives in the year preceding pregnancy. The statistical models indicated that PTSD, a sequelae affecting up to 80% of rape survivors in their lifetime (Breslau, Davis, Andreski & Peterson, 1991; Resnick, Kilpatrick, Dansky, Saunders & Best, 1993) is a very strong predictor of other decrements.

These findings also highlight that some survivors are resilient, whether from their own hardiness or thanks to appropriate post-assault care they may have received but which was not measured in the parent study. Clinicians who provide maternity care could use this framework to help distinguish those who are resilient from those experiencing ongoing distress or PTSD. It is well-established that both childhood and adult sexual assault survivors, especially those who do not recover in the immediate months post-assault, experience mental and physical morbidity across the lifespan. Pregnancy occurs early enough in the life course that interventions could have substantial influences over the course of a survivor's lifetime.

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Figure 1.
Chronic Conditions Related to Somatic Distress Organized by ICD-9 Systems Categories

Table 1

Operationalizing Practice Level Theory and Comprehensive Care

SANE goals	Practice Level Theory		Operationalization in Secondary Analysis		
	Components of comprehensive care	Conceptual definitions of comprehensive care	Components of care being assessed from STACY data	Indicators being assessed from STACY data	
1. To assess injuries and provide anticipatory guidance about somatic distress (e.g. headache, nausea, sleeplessness, pain) 2. Refer for follow-up medical care if necessary	Physical Care	Treatment of physical injuries or other sequelae of the assault	Physical health status	1a. Pre-existing chronic conditions or moderate or severe PUQE score 1b. Any substance abuse during pregnancy	
3. Evaluate pregnancy risk and offer prevention accordingly	Pregnancy Prevention	Pregnancy prevention including options if emergency contraception is not effective	Pregnancy wantedness	2. Unwantedness of pregnancy	
4. Evaluate & treat for STIs	STI Screening	STI screening and treatment	STIs in pregnancy	3. Any Infection	
5. Refer for follow-up counseling	Psychological Care	Psychological care for PTSD and other mental health sequelae	Psychological care in pregnancy	4. Current PTSD	
6. Forensic evidence collection and documentation 7. Crisis intervention 8. Protect the survivor from further harm 9. Enhance the ability of law enforcement to collect evidence and successfully prosecute	Legal Care	Legal care including safety from the perpetrator and the ability to report the assault and press charges if the survivor desires	Legal/safety in pregnancy	5. Current abuse	

Literature Review

Table 2

Elements of Health Outcome: Components of Comprehensive Care					
Conceptual Framework	Physical care of injuries or ailments related to assault	STI screening	Pregnancy prevention, including options if Plan B is not effective	Psychological care	Legal involvement including safety from the perpetrator and ability to press charges if the victim desires
Empirical support for its importance in pregnancy	Strong	Present	Strong	Strong	Indirect
Applicable Manuscripts (By first author only)	Leonardson, 2003 Lukasse, 2009 Nelson, 2010 Nerum, 2009 Van der Hulst, 2006	Lukasse, 2009 McFarlane, 2007 Nelson, 2010	Holmes, 1996 McFarlane, 2007 Nerum, 2009 Young, 2011	Eberhard-Gran, 2008 Lukasse, 2009 Garabedian, 2011 Nelson, 2010 Osbourne, 2001 Van der Hulst, 2006	McFarlane, 2007
Summary	Several studies found less well-being and more pregnancy conditions and labor complications in rape survivor group. Also a strong correlation between cigarette use during pregnancy and alcohol consumption. Women in the rape group were also found to have a higher BMI.	Two studies found increased rates of bacterial vaginosis, Chlamydia, gonorrhea, and trichomoniasis among survivors of rape and sexual violence.	Studies demonstrated a much higher incidence of unwantedness in rape-related pregnancies leading to higher numbers of elective abortions, spontaneous abortions, and adoptions. One study also demonstrated early pregnancy among childhood sexual abuse survivors.	Consistent findings that rape is associated with depression, anxiety, and PTSD.	Only one study considered intimate partner violence in pregnancy as a predictor of rape (or the concept of revictimization). Thus, the rapist and batterer could be the same or the survivor could be vulnerable to future abuse.

Table 3
Comparison of Demographic and Trauma Risk Factors for Rape Survivors versus Non-Survivors (%/n)

Rape Survivors n=99			Non-Survivors n= 848		Assault Took Place in Adulthood n=42		Assault Took Place in Childhood* n=57	
Demographic Factors			χ^2 **	p value			χ^2 **	p value
African American	55.6 (55)	41.3 (350)	7.39	.007	42.9 (18)	64.9 (37)	4.76	.029
Teen	25.3 (25)	21.7 (184)	.65	.420	21.4 (9)	28.1 (16)	.57	.452
Poverty	36.4 (36)	20.8 (176)	12.43	<.001	33.3 (14)	38.6 (22)	.29	.591
Low Education	57.6 (57)	43.8 (371)	6.84	.009	38.1 (16)	71.9 (41)	11.33	.001
High Crime	52.5 (52)	37.1 (315)	8.83	.003	(45.2) (19)	57.9 (33)	1.55	.213
High-risk SES	62.6 (62)	43.5 (369)	13.06	<.001	47.6 (20)	73.7 (42)	7.02	.008
Rape as Index Trauma	45.5 (45)	0	404.67	<.001	45.2 (19)	45.6 (26)	.001	.970
Trauma Factors M(SD)			t (df)	P value			t (df=97)	p value
Trauma Impact***	5.34 (.88)	3.81 (2.32)	12.83 (df=297.71)	<.001	5.40 (.73)	5.29 (.98)	-.59	.556
Last Year Impact****	3.96 (1.25)	2.43 (1.67)	11.03 (df=142.40)	<.001	3.71 (1.29)	4.14 (1.20)	1.69	.095
Sum of Traumas	10.2 (4.51)	3.9 (3.11)	-13.5 (df=109.2)	<.001	9.12 (3.99)	11.05 (4.72)	2.15	.034

* Eight women were survivors of an assault that took place in childhood and adulthood; they were included in the childhood subgroup

** df=1 for all χ^2 analyses

*** Impact of index trauma at the time at the time it occurred, note that rape was the index trauma for 45.5% of survivors, thus the majority of index traumas were non-rape and this "impact" rating would be in relation to other types of trauma exposure.

**** Similarly, the last year impact of the index trauma exposure refers to rape for only 45.5% of survivors who named the rape as their index trauma exposure.

Table 4

Comparison of Comprehensive Care Outcomes among Groups (%/n)

	Rape-Survivors n=99	Non-Survivors n=848 Physical Care	χ^2 p value *	Adult Rape Survivors n=42	Childhood Rape Survivors n=57	χ^2 p value *
Pre-existing Chronic Conditions/Moderate to Severe PUQE Score	63.6 (63)	53.2 (451)	$\chi^2 = 3.90, p = .048$	76.2 (32)	54.4 (31)	$\chi^2 = 4.97, p = .026$
Any Substance Use in Pregnancy	28.3 (28)	14.5 (123)	$\chi^2 = 12.60, p < .001$	16.7 (7)	36.8 (21)	$\chi^2 = 4.85, p = .028$
Pregnancy Prevention						
Pregnancy Unwantedness	54.5 (54)	51.7 (438)	$\chi^2 = .30, p = .585$	52.4 (22)	56.1 (32)	$\chi^2 = .14, p = .710$
STI Screening						
Any Infection	55.6 (55)	44.3 (376)	$\chi^2 = 4.50, p = .034$	57.1 (24)	54.4 (31)	$\chi^2 = .07, p = .785$
Psychological Care						
Current PTSD	38.4 (38)	9.3 (79)	$\chi^2 = 69.17, p < .001$	31.0 (13)	43.9 (25)	$\chi^2 = 1.70, p = .192$
Legal/Safety						
Current Abuse (physical or sexual)	15.2 (15)	2.5 (21)	$\chi^2 = 38.95, p < .001$	21.4 (9)	10.5 (6)	$\chi^2 = 2.24, p = .135$

*For all χ^2 analyses, df=1

Table 5

Logistic Regression of Full Model

Physical Care						
Pre-existing Major Chronic condition/Moderate to Severe PUQE score	Any Substance Use in Pregnancy		Pregnancy Prevention	Infection Prevention	Mental Health	Legal/Safety
			Pregnancy Unwantedness	Any Infection	Current PTSD	Current Abuse
Rape Status	1.47 *	1.46 *	1.06	1.34 *	2.71 *	3.38 *
Step 1:	NR ² = .010, p=.008	NR ² = .009, p=.024	NR ² = .000, p=.700	NR ² = .006, p=.037	NR ² = .073, p<.001	NR ² = .101, p<.001
Rape Status	1.54 *	1.15	.87	1.15	1.77 *	2.35 *
Impact at time of Trauma	1.13 *	1.06	.95	.93	1.14	1.32
Last Year Impact	.84 *	1.31 *	1.32 *	1.29 *	2.72 *	2.01 *
Step 2:	NR ² = .020, p=.027	NR ² = .066, p<.001	NR ² = .044, p<.001	NR ² = .036, p<.001	NR ² = .363, p<.001	NR ² = .237, p<.001
Rape Status	1.62 *	1.14	.83	1.17	1.74 *	2.42 *
Impact at time of Trauma	1.07	1.10	1.04	1.04	1.28	1.55
Last Year Impact	.984	1.22 *	1.06	.95	2.39 *	1.59 *
SES	.310 *	1.72 *	5.82 *	9.96 *	4.13 *	14.37 *
Step 4:	NR ² = .111, p<.001	NR ² = .080, p=.005	NR ² = .229, p<.001	NR ² = .325, p<.001	NR ² = .411, p<.001	NR ² = .322, p<.001

* Indicates a significant p-value (p<.05) for the OR shown

Table 6

Logistic Regression with PTSD as a Predictor

	Physical Care		Pregnancy Prevention		Infection Prevention		Legal/Safety	
	Pre-existing Major Chronic Condition/Moderate to Severe PUQE score	Any Substance Use in Pregnancy	Pregnancy Unwantedness	Any Infection	Current Abuse			
Rape Status	1.47 *	1.47 *	1.06	1.34 *	3.38 *			
Step 1:	NR ² = .010, p=.008	NR ² = .009, p=.024	NR ² = .000, p=.700	NR ² = .006, p=.037	NR ² = .101, p<.001			
Rape Status	1.50 *	1.15	.93	1.14	2.35 *			
PTSD Status	.96	1.60 *	1.27 *	1.37 *	2.63 *			
Step 2:	NR ² = .010, p=.582	NR ² = .059, p<.001	NR ² = .018, p<.001	NR ² = .036, p<.001	NR ² = .211, p<.001			
Rape Status	1.60 *	1.15	.88	1.12	2.66 *			
PTSD Status	1.12	1.49 *	1.03	1.07	2.02 *			
SES	.30 *	1.73 *	6.12 *	9.41 *	14.82 *			
Step 3:	NR ² = .110, p<.001	NR ² = .074, p=.004	NR ² = .224, p<.001	NR ² = .325, p<.001	NR ² = .301, p<.001			

* Indicates a significant p-value (p<.05) for the OR shown