

Associations Between Social Determinants of Health and Pregnancy Among Young People: A Systematic Review of Research Published During the Past 25 Years

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ABSTRACT

Objective. Major health disparities exist in pregnancy among young people. Although social determinant of health (SDH) approaches in interventions are promoted to reduce these disparities, little research exists that synthesizes empirical links between SDHs and pregnancy among young people. This systematic literature review utilized the Healthy People 2020 SDH framework to analyze and synthesize the empirical associations between SDHs and pregnancy among young people.

Methods. We included studies that were published in the past 25 years from PubMed, PsycINFO®, and Academic Search™ Premier databases. Twenty-two studies met all inclusion criteria and, following the Matrix Method, were assessed for methodological quality and empirical links between determinant areas and pregnancy.

Results. Seventeen studies reported an empirical association between at least one SDH and pregnancy among young people. Areas most represented were poverty and family structure. No studies examined the relationship between pregnancies among young people and quality of housing, access to healthy foods, access to health-care services and primary care, health technology, social cohesion, perceptions of discrimination/equity, access to employment, employment status, school policies that support health promotion, safe school environments, or higher education enrollment.

Conclusion. This research indicates a need to expand the range of SDHs that are analyzed with pregnancy among young people and to focus interventions on areas that have been determined to have an empirical link with pregnancy.

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Although recent reports indicate a historic decline in pregnancy among young people in the United States, pregnancy rates in the United States are still higher than in other developed countries, and marked racial/ethnic, geographic, and socioeconomic disparities persist. Reducing health disparities in pregnancies among young people is a path toward achieving health equity in the United States.¹

Research regarding pregnancy prevention among young people is often geared toward individual and interpersonal levels, including a heavy focus on knowledge, beliefs, attitudes, skills, and personal decision making.²⁻⁶ Based on this individual-level research, the majority of currently recommended and evidence-based pregnancy prevention programs are designed to intervene at these levels.^{7,8} However, current public health research and interventions are less focused on how the social determinants of health (SDHs) influence unintended pregnancy among adolescents and young adults.

The exploration of SDHs to address health disparities in pregnancy among young people is promoted by the Centers for Disease Control and Prevention.¹ An SDH approach may identify and address issues that are not feasibly addressed through individual or interpersonal behavior change approaches. SDHs can be defined as the conditions in which people are born, grow, live, work, and age.⁹ Healthy People 2020 created a framework for understanding SDHs that consists of five determinant areas: economic stability, education, social and community context, health and health care, and neighborhood and built environment.¹⁰ Within the

SDH framework, a number of critical issues are listed in each of the five determinant areas.

Research links pregnancy among young people with various SDHs that fall under a wide array of topics, including exposure to incarceration, community violence, and socioeconomic disadvantage.¹¹⁻¹³ In addition, survey data provide insight into SDHs and pregnancy among young people, especially in the area of socioeconomics. For example, children from families of lower socioeconomic status are more likely than children of families from higher socioeconomic status to experience pregnancy as an adolescent.¹⁴

We conducted a systematic review of the literature to understand whether or not SDHs influence pregnancy among young people. This study employed the Healthy People 2020 framework for SDHs to examine links between determinants and pregnancy among young people, as well as to explore reasons why these relationships may exist. The Healthy People 2020 framework for SDHs was developed as a place-based organizing framework that distinguishes five key areas of social determinants and identifies critical components within each area that are an initial set of objectives to address for the decade (Table 1).¹⁵ Models that include elements of SDHs, such as the Healthy People 2020 Framework, are recommended to guide public health practice.¹⁶

The analysis included empirical research studies that linked pregnancy among young people and SDHs in the following areas: economic stability, social and community context, neighborhood and built environment, health and health care, and education. Each of

Table 1. Healthy People 2020 social determinants of health framework key issues^a

	<i>Social determinants of health areas</i>				
	<i>Economic stability</i>	<i>Education</i>	<i>Social and community context</i>	<i>Health and health care</i>	<i>Neighborhood and built environment</i>
Critical components/ key issues	Poverty	High school graduation rates	Family structure	Access to health services	Quality of housing
	Employment status	School policies that support health promotion	Social cohesion	Access to primary care	Crime and violence
	Access to employment	School environments that are safe and conducive to learning	Perceptions of discrimination and equity	Health technology	Environmental conditions
	Housing stability	Enrollment in higher education	Civic participation Incarceration/ institutionalization		Access to healthy foods

^aDepartment of Health and Human Services (US), Office of Disease Prevention and Health Promotion. Healthy People 2020: social determinants of health [cited 2014 Oct 9]. Available from: <http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=39>

the five key areas included critical components used for the review based on the conceptual framework developed by Healthy People 2020.¹⁰

METHODS

Literature search

We searched the scholarly databases PsycINFO®, PubMed, and Academic Search™ Premier following guidelines of the Matrix Method,¹⁷ which provides guidelines to collect, organize, and analyze information in a systematic manner. When possible, medical subject heading terms were used for social determinant search terms.¹⁸ Search terms included a combination of the use of words from each key area of the SDH. (A list of keywords is available upon request.)

Inclusion and exclusion criteria

We included studies that focused on an empirical relationship between pregnancy among young people and one or more SDHs, based on the Healthy People 2020 SDH framework. Other criteria for inclusion included studies that were published during the past 25 years, from January 1988 to August 2013, and involved participants aged 13–25 years. This wide age range was selected to include a breadth of literature due to a lack of consistency in previous research of what age range defines young people.^{19,20} The date range was more than 10 years to address the rise of popularity and recognition of SDHs in the early 2000s.^{21–23} Measures for the dependent variable of pregnancy must have measured pregnancy itself rather than birth. Additional inclusion criteria were that studies were U.S.-based, peer reviewed, quantitative, and published in an English-language journal.

Studies were excluded if they did not analyze an empirical link between SDHs and pregnancy. As such, all qualitative studies, studies without a focus on links between SDHs and pregnancy among young people (e.g., management of existing pregnancy), and studies examining participants >25 years of age were excluded. In addition, studies with an outcome variable of birth or fathering a child were excluded because articles not measuring pregnancy itself violated the inclusion criteria of pregnancy as the outcome variable. Birth does not fully capture the measure of pregnancy because not all pregnancies result in birth.²⁴ Letters to the editor and other non-peer-reviewed documents were also excluded.

Data extraction

The initial search identified 5,963 studies—reviewed by a single reviewer based on title and keywords—of

which 770 abstracts were reviewed. Twenty-two articles met all inclusion criteria and were abstracted for the findings matrix (Figure). The selected articles were assessed for significant and nonsignificant empirical relationships between pregnancy among young people and one or more SDHs in the Healthy People 2020 SDH framework.¹⁰ A single study could contribute multiple findings to the review.

RESULTS

Summary of findings

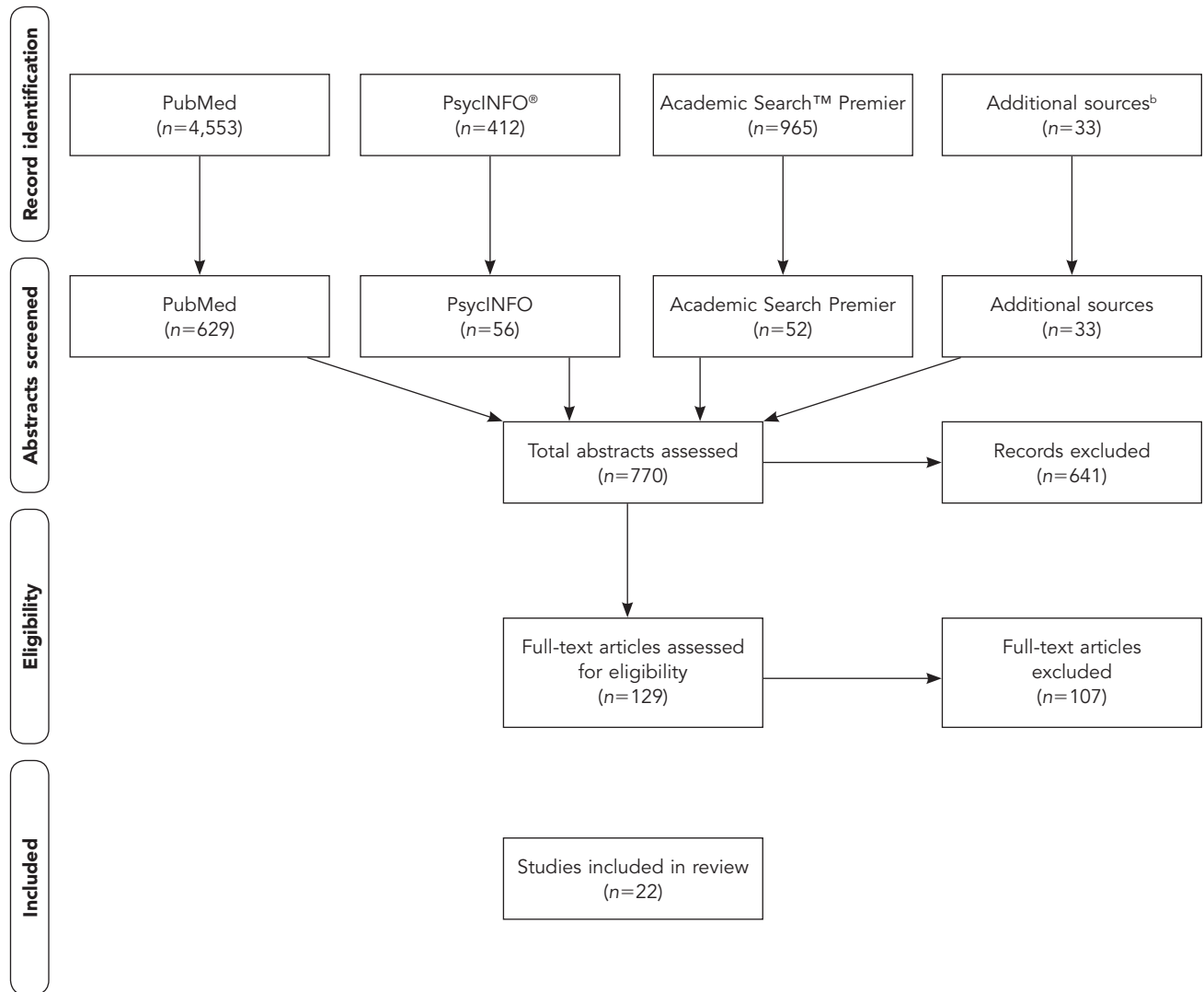
Twenty-two articles covered four of the five determinant areas of the Healthy People 2020 SDH framework. The majority of articles were in the areas of economic stability ($n=11$) and social and community context ($n=9$). No articles were identified in the determinant area of health and health care. Only eight of the 20 critical components within the five determinant areas were represented in abstracted articles. These critical components included crime and violence, environmental conditions, family structure, incarceration/institutionalization, poverty, housing stability, and high school graduation rates (Table 2). If a study analyzed more than one social determinant, it is listed in Table 2 under primary research area.

Neighborhood and built environment

Four studies included evidence in the area of neighborhood and built environment.^{25–28} Under the study framework, this area could have included studies analyzing quality of housing, crime and violence, environmental conditions, or access to healthy foods.¹⁰ Of these four critical components, crime and violence as well as environmental conditions were assessed^{25–28} (Table 2).

One study examined the relationship between gang exposure and pregnancy incidence and found that gang membership did not have a significant relationship with pregnancy (hazard ratio [HR]=1.25, 95% confidence interval [CI] 0.54, 3.45), but having a partner in a gang was associated with pregnancy incidence (HR=1.90, 95% CI 1.09, 3.32).²⁶ Additional studies related to neighborhood and built environment found that community violence was not related to a repeat pregnancy within 24 months,²⁸ and there was no significant relationship between the Broken Windows assessment—an instrument that examines neighborhood disorganization based on the condition of buildings, amount of trash, graffiti, and abandoned cars—and pregnancy before 20 years of age (HR=0.95, 95% CI 0.87, 1.04).²⁷ However, the fourth study included in the review found that a history of pregnancy was associated with living in a high-risk neighborhood environment

Figure. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram of studies empirically analyzing associations between social determinants of health and pregnancy among young people^a



^aAdapted from Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred Reporting Items for Systematic Reviews and Meta-Analyses: the PRISMA statement. *Ann Intern Med* 2009;151:264-9.

^bAdditional sources include articles included from the reference sections of other identified articles.

(adjusted odds ratio [AOR] = 2.40, 95% CI 1.10, 5.24, $p=0.028$)²⁵ (Table 2).

Social and community context

Eight studies analyzed social and community context,^{25,29-35} while one study analyzed social and community context only as a secondary variable. Under the Healthy People 2020 SDH framework, these types of articles could have included family structure, social cohesion, perceptions of discrimination/equity, civic participation, or incarceration/institutionalization.¹⁰

Of these critical components, the most commonly researched SDHs were family structure (reported in seven articles) and incarceration (reported in three articles)^{25,29-32,34-36} (Table 2).

Family structure was measured by six studies in nine different ways, including knowing one’s father, father living in the home, a two-parent household, mother married, married biological parents, stepfamily (defined as biological parent married to nonbiological parent), cohabiting (defined as biological parent living with partner but unmarried), parental separation or

Table 2. Methodological quality and findings of articles examining associations between social determinants of health and pregnancy among young people, based on components of the Healthy People 2020 Social Determinants of Health Framework, 2010*

Citation	Study purpose	Measure of pregnancy (dependent variables)	Social determinant (independent variables)	Pregnancy intention	Sample size	Sample characteristics	Sampling design	Study design	Analytic methods	Findings
Minnis et al., 2008 ^b	To examine the relationship between gang exposure and pregnancy incidence	Pregnancy incidence	Participant in a gang; partner in a gang	Unspecified	237	Sexually active females ages 14–19 years in a predominantly Latino neighborhood in San Francisco, California, participating in the Mission Teen Health Project	Nonrandom sampling; non-nationally representative	Prospective cohort study	Discrete-time survival analysis; mediation analysis	Having partners in a gang was significantly associated with pregnancy (HR=1.90, 95% CI 1.09, 3.32). Gang membership had no significant relationship with pregnancy (HR=1.25, 95% CI 0.54, 3.45).
Oman et al., 2013 ^c	To determine whether individual, family, and community assets and neighborhood conditions delay initiation of sexual intercourse, increase use of birth control, and contribute to avoidance of pregnancy	Pregnancy before age 20 years among females	Broken Windows score ^d /neighborhood conditions	Unspecified	548	Adolescents aged 12–17 years in a Midwestern city	Stratified sampling of census tracts; non-nationally representative	Longitudinal study with computer-assisted self-interview	Cox proportional hazards regression	No significant relationship was found between the Broken Windows score/neighborhood conditions and pregnancy before age 20 years (HR=0.95, 95% CI 0.87, 1.04).
Social and community context (family structure, social cohesion, perceptions of discrimination/equity, civic participation, incarceration/institutionalization)										
Barnett et al., 1991 ^e	To examine the relationship among familial, demographic, and individual characteristics and the probability of pregnancy	Pregnancy status	Family composition	Unspecified	124	12- to 19-year-old sexually active adolescent females attending health clinics and family planning programs in Arkansas	Nonrandom sample; non-national	Cross-sectional survey	Stepwise logistic regression	Family income predicted pregnancy for all participants with annual income <\$19,999 ($\beta=2.58$, $p<0.05$). Living with father only predicted pregnancy among young people ($\beta=2.12$, $p<0.05$).
Crosby et al., 2004 ^f	To identify the prevalence of health risk factors among detained adolescent females and determine racial/ethnic differences	Ever been pregnant	Incarceration	Unspecified	197	Females aged 14–18 years in eight Georgia detention facilities	Nonrandom sample; non-nationally representative	Cross-sectional survey	Chi-squared tests, t-tests, Pearson's correlations	32.2% of the sample of incarcerated adolescent females reported ever having been pregnant.
Dormire and Yarandi, 2001 ^g	To develop a predictive model that identifies young women at risk for adolescent motherhood	Currently pregnant vs. never pregnant	Whether or not the subject knows her father	Unspecified	164	Adolescents <19 years of age and beyond 24th week of pregnancy	Pregnant young people, nonrandom sample; non-pregnant, stratified; non-nationally representative	Cross-sectional survey	Chi-squared tests	Group differences existed between pregnant and never-pregnant teenage females for whether or not the subject knew the father ($\chi^2=35.18$, $p=0.001$).

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Table 2 (continued). Methodological quality and findings of articles examining associations between social determinants of health and pregnancy among young people, based on components of the Healthy People 2020 Social Determinants of Health Framework, 2010^a

Citation	Study purpose	Measure of pregnancy (dependent variables)	Social determinant (independent variables)	Pregnancy intention	Sample size	Sample characteristics	Sampling design	Study design	Analytic methods	Findings
Dworsky and Courtney, 2010 ^b	To examine how common teenage pregnancy is among young women in and aging out of foster care	Ever pregnant by age 19 years	In foster care	Unspecified	374	17- and 18-year-old females from Midwest Study and National Longitudinal Study of Adolescent Health	Midwest study, unstated; National Longitudinal Study of Adolescent Health, random sample, nationally representative	Longitudinal design with audio computer-assisted self-interviews; secondary data analysis	Descriptive statistics, Cox proportional hazard model	50.6% of participants in Midwest study of adolescents in foster care reported having been pregnant by age 19 years compared with 20.1% in the national sample. Data showed that being currently placed in group care predicted first pregnancy between baseline interview and midpoint to interview at age 19 years (HR=0.445, $p < 0.05$).
Hillis et al., 2004 ^c	To examine associations between adverse childhood experiences and pregnancy, long-term psychosocial consequences, and fetal death	Pregnancy among young people	Incarcerated family member; parents divorced/separated	Unspecified	9,159	Women aged ≥ 18 years who attended a primary care clinic in San Diego, California, in 1995-1997	Nonrandom sampling; non-nationally representative	Retrospective cohort study	Relative risks and 95% CIs	Exposure to an incarcerated family member associated with pregnancy among young people (RR=1.9, 95% CI 1.7, 2.1). Parents being divorced/separated was associated with pregnancy among young people (RR=1.6, 95% CI 1.5, 1.7).
Lang et al., 2013 ^d	To examine prevalence and factors associated with pregnancy among adolescents	History of pregnancy	Presence of father in the home; neighborhood environment	Unspecified	264	Sexually active adolescents aged 13-18 years who had received a psychological diagnosis	Random sample; non-nationally representative	Randomized clinical trial; secondary data analysis	Logistic regression	Significant factors included absentee father (AOR=3.47, 95% CI 1.53, 7.89, $p=0.003$) and high-risk neighborhood (AOR=2.4, 95% CI 1.10, 5.24, $p=0.028$).
Oettinger, 1999 ^e	To empirically examine the relationship between enrollment in sex education and subsequent sexual behavior	Transition into pregnancy (age of first pregnancy)	Live in non-intact family at age 14 years; prior sex education	Unspecified	4,945	U.S. teenagers during the 1970s who participated in the National Longitudinal Survey of Youth	Random sampling; nationally representative	Longitudinal design; secondary data analysis	Proportional hazard models	The hazard model estimation method allowed the effect of sex education to differ from ages 10-15 and 16-19 years. Coefficient estimates indicated that sex education (0.13, SE=0.10) and living in a non-intact family at age 14 years (0.43, SE=0.05) had a positive effect on pregnancy.

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Table 2 (continued). Methodological quality and findings of articles examining associations between social determinants of health and pregnancy among young people, based on components of the Healthy People 2020 Social Determinants of Health Framework, 2010^a

Citation	Study purpose	Measure of pregnancy (dependent variables)	Social determinant (independent variables)	Pregnancy intention	Sample size	Sample characteristics	Sampling design	Study design	Analytic methods	Findings
Thompson et al., 2008 ^l	To investigate predictors of teen pregnancy among homeless/runaway teens	Currently pregnant	Charged with misdemeanor, on probation, charged with felony, two-parent household	Unspecified	951	Female adolescents aged 12–18 years, from sample of 1997 Runaway/Homeless Youth Management Information System	Random sampling, nationally representative	Cross-sectional, secondary data analysis	Logistic regression	Living in a two-parent household was negatively associated with pregnancy ($\beta = -0.29$, $SE = 0.14$, $p < 0.05$). Being charged with a misdemeanor or a felony, or being on probation, were not significant.
Berry et al., 2000 ⁿ	Economic stability (poverty, employment status, access to employment, housing stability) To identify differential predictors for pregnancy among young people in four ethnic groups and better comprehend the differences among women who experienced a teenage pregnancy and those who did not	Reported a pregnancy at ≤ 19 years of age	Living below the federal poverty level at age 14 years	Unspecified	6,283	Young women aged 14–21 years from National Longitudinal Survey of Youth	Multistage stratified random sampling, nationally representative	Longitudinal survey, secondary data analysis	Logistic regression	Poverty at age 14 years was a significant predictor of pregnancy at ≤ 19 years of age (OR = 1.69, 95% CI 1.41, 2.00).
Corcoran et al., 2000 ⁿ	To discover the combination of factors that predict pregnancy and parenting status	Pregnant and parenting vs. non-pregnant and parenting	Parental income	Unspecified	105	Teenagers from 18 pregnancy intervention programs in Texas	Convenience sample	Cross-sectional survey	Logistic regression	A significant association was found between income and adolescent parenting and pregnancy (OR = 0.70, 95% CI 0.50, 0.96, $p = 0.02$).
East et al., 2010 ^b	To determine risk and protective factors predictive of pregnancy among teens	Experiencing a pregnancy	Poverty	Unspecified	128	Latina and African American teens aged 13–19 years	Purposive sampling; non-national representative	Longitudinal, prospective study	Logistic regression	Family poverty was not found to be significantly associated with pregnancy in bivariate testing and was not included in the regression model ($r = 0.15$, $p > 0.05$).
Greene et al., 1998 ^b	To compare estimates of pregnancy prevalence among runaway and homeless young people with young people in the general population	Ever been pregnant	Currently homeless young people in street or shelter settings; recent runaway/homeless and non-runaway/non-homeless	Unspecified	Street sample (n = 85); shelter sample (n = 169); recent runaway/homeless (n = 379); non-runaway/non-homeless (n = 1,609)	Teens and young adults aged 12–21 years living in shelters or on the streets in 1992 compared with nationally representative sample from Youth Risk Behavior Survey (YRBS)	Nationally representative multistage sampling for shelter and street surveys; random, nationally representative YRBS	Cross-sectional survey; secondary data analysis	Chi-squared tests	Lifetime pregnancy prevalence for youth street sample (48.2%, n = 85) and shelter sample (33.2%, n = 169) was significantly different from YRBS sample that reported recent runaway or homeless (8.4%, n = 379) and YRBS non-runaway/non-homeless groups (7.2%, n = 1,609).

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Table 2 (continued). Methodological quality and findings of articles examining associations between social determinants of health and pregnancy among young people, based on components of the Healthy People 2020 Social Determinants of Health Framework, 2010^a

Citation	Study purpose	Measure of pregnancy (dependent variables)	Social determinant (independent variables)	Pregnancy intention	Sample size	Sample characteristics	Sampling design	Study design	Analytic methods	Findings
Lau et al., 2013 ^a	To identify markers associated with pregnancy prevalence among U.S. adolescent females	Number of times pregnant in life	Family income at percentage of poverty level	Unspecified	2,528	Females aged 15–19 years	Random sampling; nationally representative	Cross-sectional survey; secondary data analysis	Recursive partitioning analysis	A significant association was found between family income at percentage below poverty level and ever being pregnant ($p<0.01$).
Moore and Chase-Landsdale, 2001 ^b	To examine the role of family and perceived community environment on sexual intercourse and pregnancy	Ever been pregnant	Income-needs ratio; family welfare receipt; mother married; married biological parents; stepfamily; cohabiting	Unspecified	289	African American teens aged 15–18 years in high-poverty neighborhoods in Chicago	Randomized block quota technique; non-nationally representative	Cross-sectional; secondary data analysis	Logistic regression	Income-needs ratio and mother being married were significantly associated with pregnancy, but family welfare was not ($OR=0.55$, $p<0.05$). Married parents, stepfamily, or cohabiting was not significant.
Rodgers and McGuire, 2012 ^b	To study adolescent sexual risk and interpersonal, violence, parenting, and poverty contexts	History of pregnancy	Community poverty	Unspecified	2,108	7th-, 9th-, and 11th-grade adolescents in the Southeast participating in a larger community-based health assessment	Nonrandom sample; non-nationally representative	Cross-sectional survey	Multilevel modeling	Community poverty did not significantly predict pregnancy ($OR=1.45$).
Crosby and Holtgrave, 2006 ^c	To investigate whether social capital may explain differences in teen pregnancy rates in the United States	Teen pregnancy rates	Poverty; income inequality	Unspecified	Not reported	Female teens aged 15–19 years in the United States	Nonrandom sample; non-nationally representative	Cross-sectional survey; secondary data analysis	Pearson's product moment correlation coefficients; linear regression model	Poverty was correlated with pregnancy rates in bivariate associations only ($r=0.44$, $p=0.002$); income inequality was significant in regression analysis ($\beta=0.24$, $p=0.017$).
Raneri and Wiemann, 2007 ^a	To understand the individual, dyad, family, peer/community, and social system-level risk factors for repeat pregnancy among young people	Repeat pregnancy within 24 months	Limited economic resources; community violence; dropped out of school prior to first pregnancy	Unspecified	581	Mothers aged 12–18 years who were black, Mexican American, or white as part of a larger study on drug use	Convenience sample; non-nationally representative	Longitudinal study	Bivariate analyses and logistic regression	Having limited economic resources was associated with repeat pregnancy after bivariate analysis (29.0%, $p<0.05$). No other social determinant factors were significant after multivariate tests.
Sabo et al., 1999 ^b	To determine whether high school athletic participation was associated with reduced rates of sexual behavior and pregnancy involvement	Pregnancy	Income	Unspecified	612	Adolescents aged 13–16 years from western New York participating in Longitudinal Family and Adolescent Study	Random sampling using random-digit dialing on a computer-assisted telephone network; non-nationally representative	Longitudinal; secondary analysis	Path analysis	The study found correlations between income and pregnancy ($r=-0.19$, $p<0.01$). The standardized regression coefficients for pregnancy involvement and income showed effects for girls ($\beta=-0.17$, $p<0.01$).

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Table 2 (continued). Methodological quality and findings of articles examining associations between social determinants of health and pregnancy among young people, based on components of the Healthy People 2020 Social Determinants of Health Framework, 2010^a

Citation	Study purpose	Measure of pregnancy (dependent variables)	Social determinant (independent variables)	Pregnancy intention	Sample size	Sample characteristics	Sampling design	Study design	Analytic methods	Findings
Young et al., 2004 ^b	To identify antecedents of teen pregnancy	Pregnancy	Family income	Unspecified	937	Eighth-grade females who participated in National Education Longitudinal Study	Nationally representative; probability sample	Longitudinal design; secondary data analysis	Logistic regression	Family income and later teen pregnancy was significant in bivariate tests but not in logistic regression (OR=0.99, p=0.747).
Education (high school graduation rates, school policies that support health promotion, safe school environments, higher education enrollment)										
Coard et al., 2000 ^c	To examine socio-demographic, family, and health factors of repeat pregnancy among urban adolescents	Repeat pregnancy	School status	Unspecified	80	First-time adolescent mothers aged 13–17 years in an urban clinic	Convenience sampling; non-nationally representative	Cross-sectional questionnaire; secondary data analysis	Bivariate statistics	School status was not significantly related to repeat pregnancy in year one ($\chi^2=0.809$) or year two ($\chi^2=3.75$).
^a No articles identified a link between pregnancy and the social determinant of health (SDH) health and health care. As such, only four SDHs from the Healthy People 2020 SDH framework are listed along with articles showing a link between those SDHs and pregnancy. Source: Department of Health and Human Services (US). The Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020: phase I report: recommendations for the framework and format of Healthy People 2020. 2008 [cited 2015 Sep 24]. Available from: URL: http://www.healthypeople.gov/sites/default/files/phase_0.pdf ^b Minnis AM, Moore JG, Doherty JA, Rodas C, Auerswald C, Shiboski S, et al. Gang exposure and pregnancy incidence among female adolescents in San Francisco: evidence for the need to integrate reproductive health with violence prevention efforts. <i>Am J Epidemiol</i> 2008;167:1102-9. ^c Oman RF, Vesely SK, Aspy CB, Tolma EL, Gavin L, Bensyl DM, et al. A longitudinal study of youth assets, neighborhood conditions, and youth sexual behaviors. <i>J Adolesc Health</i> 2013;52:779-85. ^d Cohen D, Spear S, Scribner R, Kissinger P, Mason K, Wildgen J. "Broken windows" and the risk of gonorrhea. <i>Am J Public Health</i> 2000;90:230-6. ^e Barnett JK, Papini DR, Gbur E. Familial correlates of sexually active pregnant and nonpregnant adolescents. <i>Adolescence</i> 1991;26:457-72. ^f Crosby R, Salazar LF, DiClemente RJ, Yarber WL, Caliendo AM, Staples-Horne M. Health risk factors among detained adolescent females. <i>Am J Prev Med</i> 2004;27:404-10. ^g Dormire SL, Yarandi H. Predictors of risk for adolescent childbearing. <i>Appl Nurs Res</i> 2001;14:81-6. ^h Dworsky A, Courtney ME. The risk of teenage pregnancy among transitioning foster youth: implications for extending state care beyond age 18. <i>Child Youth Serv Rev</i> 2010;32:1351-6. ⁱ Hillis SD, Anda RF, Dube SR, Felitti VJ, Marchbanks PA, Marks JS. The association between adverse childhood experiences and adolescent pregnancy, long-term psychosocial consequences, and fetal death. <i>Pediatrics</i> 2004;113:320-7. ^j Lang DL, Rieckmann T, DiClemente RJ, Crosby RA, Brown LK, Donenberg GR. Multi-level factors associated with pregnancy among urban adolescent women seeking psychological services. <i>J Urban Health</i> 2013;90:212-23. ^k Oettinger GS. The effects of sex education on teen sexual activity and teen pregnancy. <i>J Political Econ</i> 1999;107:606-44. ^l Thompson SJ, Bender KA, Lewis CM, Watkins R. Runaway and pregnant: risk factors associated with pregnancy in a national sample of runaway/homeless female adolescents. <i>J Adolesc Health</i> 2008;43:125-32. ^m Berry EH, Shillington AM, Peak T, Hohman MM. Multi-ethnic comparison of risk and protective factors for adolescent pregnancy. <i>Child Adolesc Soc Work J</i> 2000;17:79-96. ⁿ Corcoran J, Franklin C, Bennett P. Ecological factors associated with adolescent pregnancy and parenting. <i>Soc Work Res</i> 2000;24:29-39.										

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Table 2 (continued). Methodological quality and findings of articles examining associations between social determinants of health and pregnancy among young people, based on components of the Healthy People 2020 Social Determinants of Health Framework, 2010^a

- ^aEast PL, Khoo ST, Reyes BT. Risk and protective factors predictive of adolescent pregnancy: a longitudinal, prospective study. *Appl Dev Sci* 2006;10:188-99.
- ^bGreene JM, Ringwalt CL. Pregnancy among three national samples of runaway and homeless youth. *J Adolesc Health* 1998;23:370-7.
- ^cLau M, Lin H, Flores G. Clusters of markers identify high and low prevalence of adolescent pregnancy in the U.S. *J Pediatr Adolesc Gynecol* 2013;26:40-6.
- ^dMoore MR, Chase-Lansdale PL. Sexual intercourse and pregnancy among African American girls in high-poverty neighborhoods: the role of family and perceived community environment. *J Marriage Fam* 2001; 63:1146-57.
- ^eRodgers KB, McGuire JK. Adolescent sexual risk and multiple contexts: interpersonal violence, parenting, and poverty. *J Interpers Violence* 2012;27:2091-107.
- ^fCrosby RA, Holtgrave DR. The protective value of social capital against teen pregnancy: a state-level analysis. *J Adolesc Health* 2006;38:556-9.
- ^gRaneri LG, Wiemann CM. Social ecological predictors of repeat adolescent pregnancy. *Perspect Sex Reprod Health* 2007;39:39-47.
- ^hSabo DF, Miller KE, Farrell MP, Melnick MJ, Barnes GM. High school athletic participation, sexual behavior and adolescent pregnancy: a regional study. *J Adolesc Health* 1999;25:207-16.
- ⁱYoung T, Turner J, Denny G, Young M. Examining external and internal poverty as antecedents of teen pregnancy. *Am J Health Behav* 2004;28:361-73.
- ^jCoard SI, Nitz K, Felice ME. Repeat pregnancy among urban adolescents: sociodemographic, family, and health factors. *Adolescence* 2000;35:193-200.

HR = hazard ratio

CI = confidence interval

RR = relative risk

AOR = adjusted odds ratio

OR = odds ratio

divorce, or living in group foster care. All associations were significant except for the study that examined married biological parents, stepfamily, and cohabitation³³ (Table 2).

Of studies examining young people living with one or both biological parents, one found that living with the father only predicted pregnancy status ($p < 0.05$).²⁹ However, another study indicated a positive association between a father not living in the home and adolescent pregnancy (AOR = 3.47, 95% CI 1.53, 7.89, $p = 0.003$).²⁵ Another study found group differences between pregnant and never-pregnant adolescent females by whether or not they knew their father ($\chi^2 = 35.18$, $p = 0.001$).³¹ Additional findings reported a negative association between living in a two-parent household and pregnancy ($\beta = 0.29$, standard error = 0.14, $p < 0.05$)³⁵ as well as a significant positive association between divorced or separated parents and pregnancy among young people (relative risk [RR] = 1.6, 95% CI 1.5, 1.7).³² A study that examined family structure in greater detail indicated that the mother being married was negatively associated with pregnancy among young people, while having married biological parents, a stepfamily, or a parent cohabiting with a partner were not associated with pregnancy in the full model.³³

A study examining family structure by researching adolescents in foster care found that 50.6% of foster care participants had ever been pregnant by 19 years of age in comparison with 20.1% of their peers in a national sample. In addition, data indicated that being currently in group care predicted a first pregnancy between the baseline interview and midpoint of the study³⁶ (Table 2).

The critical component of incarceration was examined by both exposure to incarceration of a family member and incarceration of the young person. Exposure to an incarcerated family member was found to be positively associated with pregnancy among young people (RR = 1.9, 95% CI 1.7, 2.1).³² One study found that 32.2% of a sample of incarcerated adolescent females reported ever having been pregnant, which is higher than the national average.³⁰ However, a second study reported no associations between pregnancy and being charged with a misdemeanor, being on probation, or being charged with a felony³⁵ (Table 2).

Economic stability

Economic stability was examined in 12 studies.^{28–30,33,37–44} Under the guiding framework, studies eligible to be included in this area would have examined key areas of poverty, employment status, access to employment, or housing stability.¹⁰ In abstracted articles where measures of income were utilized instead of poverty, these

measures were included. Of these critical components, 11 studies examined poverty^{28–30,33,37–39,41–44} and only one study examined housing stability⁴⁰ (Table 2).

Among studies examining poverty, seven studies found a significant association with pregnancy among young people,^{29,30,33,37,38,41,43} two studies found significant associations in bivariate testing only,^{28,44} and two studies found no relationship between poverty and pregnancy.^{39,42} The seven studies that found significant associations between poverty and pregnancy among young people included those living below the federal poverty level (FPL) at 14 years of age, family income, poverty, parental income, and income-needs ratio. One study indicated that poverty at 14 years of age was a significant predictor of pregnancy by age 19 years (odds ratio [OR] = 1.69, 95% CI 1.41, 2.00),³⁷ and another study indicated that annual family income <\$19,999 predicted pregnancy among young people ($p < 0.05$).²⁹ Additional studies supported these results, including one that associated income and adolescent parenting with pregnancy (OR = 0.70, 95% CI 0.50, 0.96, $p = 0.02$),³⁸ one that associated parental income at percentage below FPL with number of times pregnant in life ($p < 0.01$),⁴¹ and another associating income with pregnancy ($\beta = -0.17$, $p < 0.01$)⁴³ (Table 2).

Not all included studies found significant associations linking economic stability-related measures with adolescent pregnancy. A study including related measures reported that the income-needs ratio was significantly associated with ever having been pregnant, but family welfare receipt was not (OR = 0.55, $p < 0.05$).³³ Another study found that poverty ($r = 0.44$, $p = 0.002$) and income equality ($r = 0.53$, $p < 0.001$) were positively associated with teen pregnancy rates in bivariate associations; however, only income equality was significant in the linear regression model ($\beta = 0.24$, $p = 0.017$).⁴⁵ Two additional studies found significance between pregnancy and limited economic resources or family income only at bivariate levels.^{28,44} However, nonsignificant findings included that family poverty was not significantly associated with pregnancy³⁹ and that poverty did not significantly predict a history of pregnancy (OR = 1.45)⁴² (Table 2).

The one study that did not examine poverty within the economic determinant analyzed current homeless or runaway young people and pregnancy. The lifetime pregnancy prevalence for young people living on the street (48.2%, $n = 85$) and in shelters (33.2%, $n = 169$) was significantly higher than a national sample of runaway/homeless young people (8.4%, $n = 379$) and non-runaway/non-homeless young people (7.2%, $n = 1,609$)⁴⁰ (Table 2).

Education

We identified two articles under the determinant of education, and neither article reported significant associations between pregnancy and education.^{28,46} In the Healthy People 2020 SDH framework, the social determinant of education encompasses high school graduation rates, school policies that support health promotion, safe school environments, and higher education enrollment.¹⁰ One study found that dropping out of school prior to first pregnancy was not associated with pregnancy rates,²⁸ while the second study found that school status was not significantly related to repeat pregnancy within one year ($\chi^2=0.809$) or two years ($\chi^2=3.75$)⁴⁶ (Table 2).

Methodological quality

Of the 22 studies included in the review, 11 employed cross-sectional designs,^{29–31,33,35,38,40–42,45,46} eight used longitudinal designs,^{27,28,34,36,37,39,43,44} one was a prospective cohort study,²⁶ one was a retrospective cohort study,³² and one was a cross-sectional, randomized clinical trial.²⁵ The sample sizes ranged from 80 participants⁴⁶ to 9,159 participants.³² No studies reported reliability or validity for any measures related to SDHs or pregnancy. Twelve studies analyzed secondary data.^{25,33–37,40,41,43–46} Nine studies employed logistic regression analyses,^{25,28,29,33,35,37–39,44} four studies employed bivariate analyses,^{31,40,45,46} and three studies used Cox proportional hazards regression.^{27,34,36} Six studies reported 95% CIs^{25–27,32,37,38} (Table 2).

DISCUSSION

This study employed the Healthy People 2020 SDH framework to examine links between determinants and pregnancy among young people and explore reasons for these relationships. Although four of the five determinants were found in the included studies, many of the critical components within these determinants were not included. For example, no studies examined the relationship between pregnancies among young people and quality of housing, access to healthy foods, access to health-care services and primary care, health technology, social cohesion, perceptions of discrimination/equity, access to employment, employment status, school policies that support health promotion, safe school environments, or higher education enrollment.

The fact that 13 of the 20 critical components within the five determinant areas of health were not represented by studies in this review indicates a gap in the literature. Healthy People 2020 identified these critical components as areas in need of intervention in all aspects of health promotion this decade (i.e.,

2010–2020); yet, without empirical evidence it is not prudent to begin interventions in areas that have not been linked to pregnancy among young people. Young people up to 25 years of age were included and those aged >25 years were excluded based on research indicating that brain development and decision-making processes do not reach full maturity until this age; however, this review did not provide information on the full age range of this population.^{47,48} Indications of brain development not reaching maturity until 25 years of age indicates a need for further research among young adults in their early to mid-20s.

We found studies of varying methodological quality and a body of literature that was largely stagnant in terms of analytic methods. For one, half of all research findings on pregnancy and social determinant areas of health were based on cross-sectional study designs. Future research should employ more sophisticated (i.e., longitudinal) designs in an effort to improve the ability to link social determinants to a later pregnancy, thereby enhancing causal inference. Second, no studies reported reliability or validity for any measures related to SDHs or pregnancy. This type of exclusion limited our ability to conduct meta-analytic studies and to assess evidence regarding appropriate measurement of constructs. Third, most studies employed very simple bivariate or, at best, multivariable analyses, such as logistic regression. Only one study employed path analysis, and no other research utilized structural equation modeling (SEM). More sophisticated analyses regarding linkages between SDHs and pregnancy are needed. For example, SEM of these data would be critical, as SEM maintains several advantages over simpler analytic techniques.⁴⁹ SDH research would be best situated if its analytic techniques mirrored this reality of health and human behavior.

Strengths and limitations

Our study was unique in that it utilized a framework to tie together a wide array of SDHs and examine key areas within each determinant that have been identified as vital to address in 2010–2020.¹ Previous systematic reviews in this area have not been limited to social determinants nor have they used a framework tied to ongoing action such as Healthy People 2020.⁸ And, as noted previously, this study revealed a gap in the literature: 13 of the 20 critical components within the five determinant areas of health were not represented by studies in this review. The findings of this study indicate the need to support interventions in pregnancy among young people based on many areas of SDHs.

This study was also subject to several limitations. First, the Healthy People 2020 SDH framework

includes critical components for the decade, but may not include an exhaustive compilation of elements of SDHs. Second, this review included study designs that were experimental as well as nonexperimental, which limited our ability to assess study findings uniformly. Utilizing the measure of pregnancy as inclusion criteria excluded similar studies that measured birth, fathering a child, or being a male involved in a pregnancy. Third, this review predominantly included studies that sampled teenagers and young adults up to 25 years of age. Therefore, the associations made in this review cannot be generalized to “older” young people. Fourth, pregnancy was measured in several different ways. Although no studies included in the final review had participants older than 21 years of age, differences in pregnancies among younger adolescents (aged 12–15 years) and older adolescents/young adults were found. Fifth, none of the included studies measured pregnancy intention, so we were not able to discuss this aspect. Sixth, this systematic review was conducted by a single reviewer rather than multiple reviewers, which may have introduced bias in assessing each study. Finally, the review included only published studies, which may have excluded information from studies in which the findings were not significant or were otherwise not published (i.e., the file drawer effect).

PUBLIC HEALTH IMPLICATIONS

We found evidence in the literature regarding the relationship between areas of SDHs and pregnancy among young people. SDHs have been indicated as a vital way to reduce health disparities in pregnancy among young people.¹ To most effectively use information on SDHs to create interventions in this area, we must first base these interventions on empirical evidence. This review provides evidence of areas in which pregnancy among young people has been linked to such SDHs as measures of economic stability, education, social and community context, and neighborhood and built environment; however, more work is needed to envision the full picture of the relationship between SDHs and pregnancy among young people.

As an analysis of secondary data, this analysis was determined as exempt by the University of South Florida Institutional Review Board.

REFERENCES

- Centers for Disease Control and Prevention (US). Disparities in teen birth rates. 2015 [cited 2015 Sep 28]. Available from: <http://www.cdc.gov/teenpregnancy/about/index.htm>
- Grenshaw DA, Lee J. At-risk adolescents: self-esteem, youth violence, and teen pregnancy. In: Guindon MH, editor. Self-esteem across the lifespan: issues and interventions. New York: Routledge/Taylor & Francis Group; 2010. p. 143-57.
- Deptula DP, Henry DB, Schoeny ME. How can parents make a difference? Longitudinal associations with adolescent sexual behavior. *J Fam Psychol* 2010;24:731-9.
- Finer LB, Philbin JM. Sexual initiation, contraceptive use, and pregnancy among young adolescents. *Pediatrics* 2013;131:886-91.
- House LD, Mueller T, Reininger B, Brown K, Markham CM. Character as a predictor of reproductive health outcomes for youth: a systematic review. *J Adolesc Health* 2010;46(3 Suppl):S59-74.
- Reese BM, Haydon AA, Herring AH, Halpern CT. The association between sequences of sexual initiation and the likelihood of teenage pregnancy. *J Adolesc Health* 2013;52:228-33.
- Department of Health and Human Services (US), Office of Adolescent Health. Evidence-based programs [cited 2015 Sep 24]. Available from: http://www.hhs.gov/ash/oah/oah-initiatives/teen_pregnancy/db/tpp-searchable.html
- Kirby D. Emerging answers 2007: research findings on programs to reduce teen pregnancy—full report. Washington: The National Campaign to Prevent Teen and Unplanned Pregnancy; 2007. Also available from: http://www.thenationalcampaign.org/EA2007/EA2007_full.pdf [cited 2013 Oct 5].
- World Health Organization. Social determinants of health [cited 2013 Aug 28]. Available from: http://www.who.int/social_determinants/en
- Department of Health and Human Services (US), Office of Disease Prevention and Health Promotion. Healthy People 2020: social determinants of health [cited 2013 Aug 28]. Available from: <http://www.healthypeople.gov/2020/topicsobjectives2020/overview.aspx?topicid=39>
- Miller E, Levenson R, Herrera L, Kurek L, Stofflet M, Marin L. Exposure to partner, family, and community violence: gang-affiliated Latina women and risk of unintended pregnancy. *J Urban Health* 2012;89:74-86.
- Penman-Aguilar A, Carter M, Snead MC, Kourtis AP. Socioeconomic disadvantage as a social determinant of teen childbearing in the U.S. *Public Health Rep* 2013;128(Suppl 1):5-22.
- Whalen ML, Loper AB. Teenage pregnancy in adolescents with an incarcerated household member. *West J Nurs Res* 2014;36:346-61.
- Singh S, Darroch JE, Frost JJ. Socioeconomic disadvantage and the adolescent women's sexual and reproductive behavior: the case of five developed countries. *Fam Plann Perspect* 2001;33:251-8, 289.
- Department of Health and Human Services (US). The Secretary's Advisory Committee on National Health Promotion and Disease Prevention objectives for 2020: phase I report: recommendations for the framework and format of Healthy People 2020. 2008 [cited 2015 Sep 24]. Available from: http://www.healthypeople.gov/sites/default/files/phaseI_0.pdf
- Golden SD, Earp AL. Social ecological approaches to individuals and their contexts: twenty years of *Health Education & Behavior* health promotion interventions. *Health Educ Behav* 2012;39:364-72.
- Garrard J. Health sciences literature review made easy: the Matrix Method. Sudbury (MA): Jones and Bartlett Publishers; 2004.
- National Institutes of Health (US), National Library of Medicine. Medical subject headings [cited 2013 Mar 26]. Available from: <http://www.nlm.nih.gov/mesh>
- World Health Organization. Adolescents: health risks and solutions. 2014 [cited 2014 Jul 8]. Available from: <http://www.who.int/mediacentre/factsheets/fs345/en>
- Centers for Disease Control and Prevention (US). Sexually transmitted diseases: reportable STDs in young people 15–24 years of age, by state [cited 2014 Jul 8]. Available from: <http://www.cdc.gov/std/stats/by-age/15-24-all-stds/default.htm>
- Kindig DA. Understanding population health terminology. *Milbank Q* 2007;85:139-61.
- Krieger N. A glossary for social epidemiology. *J Epidemiol Community Health* 2001;55:693-700.
- Raphael D. Social determinants of health: Canadian perspectives. Toronto: Canadian Scholar's Press; 2004.
- Ventura SJ, Curtin SC, Abma JC, Henshaw SK. Estimated pregnancy rates and rates of pregnancy outcomes for the United States, 1990–2008. *Natl Vital Stat Rep* 2012 Jun 20;60(7):1-22.
- Lang DL, Rieckmann T, DiClemente RJ, Crosby RA, Brown LK, Donenberg GR. Multi-level factors associated with pregnancy among

- urban adolescent women seeking psychological services. *J Urban Health* 2013;90:212-23.
26. Minnis AM, Moore JG, Doherty IA, Rodas C, Auerswald C, Shiboski S, et al. Gang exposure and pregnancy incidence among female adolescents in San Francisco: evidence for the need to integrate reproductive health with violence prevention efforts. *Am J Epidemiol* 2008;167:1102-9.
 27. Oman RF, Vesely SK, Aspy CB, Tolma EL, Gavin L, Bensyl DM, et al. A longitudinal study of youth assets, neighborhood conditions, and youth sexual behaviors. *J Adolesc Health* 2013;52:779-85.
 28. Raneri LG, Wiemann CM. Social ecological predictors of repeat adolescent pregnancy. *Perspect Sex Reprod Health* 2007;39:39-47.
 29. Barnett JK, Papini DR, Gbur E. Familial correlates of sexually active pregnant and nonpregnant adolescents. *Adolescence* 1991;26:457-72.
 30. Crosby R, Salazar LF, DiClemente RJ, Yarber WL, Caliendo AM, Staples-Horne M. Health risk factors among detained adolescent females. *Am J Prev Med* 2004;27:404-10.
 31. Dormire SL, Yarandi H. Predictors of risk for adolescent childbearing. *Appl Nurs Res* 2001;14:81-6.
 32. Hillis SD, Anda RF, Dube SR, Felitti VJ, Marchbanks PA, Marks JS. The association between adverse childhood experiences and adolescent pregnancy, long-term psychosocial consequences, and fetal death. *Pediatrics* 2004;113:320-7.
 33. Moore MR, Chase-Lansdale PL. Sexual intercourse and pregnancy among African American girls in high-poverty neighborhoods: the role of family and perceived community environment. *J Marriage Fam* 2001;63:1146-57.
 34. Oettinger GS. The effects of sex education on teen sexual activity and teen pregnancy. *J Political Econ* 1999;107:606-44.
 35. Thompson SJ, Bender KA, Lewis CM, Watkins R. Runaway and pregnant: risk factors associated with pregnancy in a national sample of runaway/homeless female adolescents. *J Adolesc Health* 2008;43:125-32.
 36. Dworsky A, Courtney ME. The risk of teenage pregnancy among transitioning foster youth: implications for extending state care beyond age 18. *Child Youth Serv Rev* 2010;32:1351-6.
 37. Berry EH, Shillington AM, Peak T, Hohman MM. Multi-ethnic comparison of risk and protective factors for adolescent pregnancy. *Child Adolesc Soc Work J* 2000;17:79-96.
 38. Corcoran J, Franklin C, Bennett P. Ecological factors associated with adolescent pregnancy and parenting. *Soc Work Res* 2000;24:29-39.
 39. East PL, Khoo ST, Reyes BT. Risk and protective factors predictive of adolescent pregnancy: a longitudinal, prospective study. *Appl Dev Sci* 2006;10:188-99.
 40. Greene JM, Ringwalt CL. Pregnancy among three national samples of runaway and homeless youth. *J Adolesc Health* 1998;23:370-7.
 41. Lau M, Lin H, Flores G. Clusters of markers identify high and low prevalence of adolescent pregnancy in the U.S. *J Pediatr Adolesc Gynecol* 2013;26:40-6.
 42. Rodgers KB, McGuire JK. Adolescent sexual risk and multiple contexts: interpersonal violence, parenting, and poverty. *J Interpers Violence* 2012;27:2091-107.
 43. Sabo DF, Miller KE, Farrell MP, Melnick MJ, Barnes GM. High school athletic participation, sexual behavior and adolescent pregnancy: a regional study. *J Adolesc Health* 1999;25:207-16.
 44. Young T, Turner J, Denny G, Young M. Examining external and internal poverty as antecedents of teen pregnancy. *Am J Health Behav* 2004;28:361-73.
 45. Crosby RA, Holtgrave DR. The protective value of social capital against teen pregnancy: a state-level analysis. *J Adolesc Health* 2006;38:556-9.
 46. Coard SI, Nitz K, Felice ME. Repeat pregnancy among urban adolescents: sociodemographic, family, and health factors. *Adolescence* 2000;35:193-200.
 47. Giedd JN, Blumenthal J, Jeffries NO, Castellanos FX, Liu H, Zijdenbos A, et al. Brain development during childhood and adolescence: a longitudinal MRI study. *Nature Neurosci* 1999;2:861-3.
 48. Johnson SB, Blum RW, Giedd JN. Adolescent maturity and the brain: the promise and pitfalls of neuroscience research in adolescent health policy. *Adolesc Health* 2009;45:216-21.
 49. Buhi ER, Goodson P, Neilands TB, Blunt H. Adolescent sexual abstinence: a test of an integrative theoretical framework. *Health Educ Behav* 2011;38:63-79.