

**SOCIAL SUPPORT IN PREGNANT TEENS:
A SYSTEMATIC REVIEW OF SOCIAL SUPPORT INTERVENTIONS**

by

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ABSTRACT

Pregnant African American teens face a number of health and social risks that influence the welfare of their babies. The potential to reduce risks of maternal and infant mortality and morbidity in this population is of great public health significance. Supportive programs have demonstrated success in improving outcomes for young mom and baby. The purpose of this thesis is to systematically present the research literature available documenting adolescent pregnancy and parenting programs with a strong social support component. A systematic review of the literature was conducted using three electronic databases to identify social support interventions among pregnant minority adolescents. Interventions were included if they were published between 1991 and March of 2014, occurred in the United States, had participants who were of adolescent age, pregnant, African American or belonging to a minority group, included a social support component, and was published in English. Thirty-three publications were selected for review, describing 25 interventions devoted to the promotion of social support among pregnant teenagers. Characteristics were examined for each intervention; program setting, theoretical basis, participant demographics, components, facilitators, intensity of intervention, and reported outcomes were reviewed. Interventions were provided in clinic-, school-, and community-based settings. The findings of this review suggest that there is strong support for programs promoting social support among pregnant teens. However, minority youth continue to

experience elevated risks of adverse health and social consequences of pregnancy. There is a need for dissemination of research findings to community agencies that serve this vulnerable population.

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PREFACE

As I began the process of conducting focus groups with pregnant teenagers in Pittsburgh, I had the pleasure of conversing with dozens of agencies and individuals, all seeking to improve outcomes among this population. I was pleased at the response of support for my research and that many expressed a desire for the products of my work. Though the focus groups did not pan out, I endeavored to create a thesis that would be of use to those serving young minority women in the community.

They say, “it takes a village...” and I certainly have a village to thank for supporting me through the completion of my thesis. My deepest gratitude goes out to my loving family and friends, who often lent an ear and offered words of encouragement. A special thanks goes to Leon, for long nights spent talking me out of giving up via *Google Hangout*. My peers and the enlightened faculty and staff at Pitt Public Health enriched my studies and daily life as I strove for a deeper sense of understanding. Dr. Terry, thank you for allowing me to take advantage of your vast expanse of knowledge, and for your unwavering support. Your expertise and guidance was invaluable to this thesis. Many thanks also go to Dr. Talbott, for always being a model of professionalism and class, as well as a great boss. To Beth, for your endless encouragement and commitment to keeping it real – thank you for helping me through the process while keeping it

all together! I'd like to thank the Center for Health Equity for supporting my vision, and Barbara Folb for her assistance in undertaking this systematic review process. Lastly, I have my father to thank for imparting in me your lifelong love of learning and discovery towards a greater good. Your love will forever remain in my heart.

1.0 INTRODUCTION

Adolescent pregnancy is a complex issue with outcomes that involve and impact multiple biological, interpersonal, and environmental factors. In the literature, social support has emerged as an important multi-level factor with potential to improve outcomes in maternal depression, parenting (Cox et al., 2008), and healthy child development, among other outcomes (Bell, Zimmerman, Almgren, Mayer, & Huebner, 2006; Logsdon, Gagne, Hughes, Patterson, & Rakestraw, 2005). The goal of this study was to systematically present and review the research literature available documenting the impact of adolescent pregnancy and parenting programs with a strong social support component. The background chapter of this paper discusses adolescent pregnancy in the context of associated health risks, social consequences and influences, adverse psychological outcomes, and the role of social support. The methodology of this study is presented next, followed by results and discussion of intervention studies built to improve social support in the lives of pregnant adolescents. Though many interventions are available, there is a need for additional research on how to improve outcomes, as well as literature that is comprehensive and accessible to community practitioners.

2.0 BACKGROUND: ADOLESCENT PREGNANCY

Worldwide, an estimated 16 million young women aged 15 to 19 give birth every year (World Health Organization [WHO], 2012). Young women face four times the risk of maternal death compared to women in their 20s, and the risk of their infant dying at or around the time of birth is 50% higher (Braine, 2009). In the United States (US), young women from minority and low socio-economic groups disproportionately experience poor reproductive health and family planning outcomes (Hall, Moreau, & Trussell, 2011).

A convergence of social, behavioral, and environmental factors, for example, race/ethnicity, age at first sex, and perceived neighborhood safety, contributes to the persistence of adolescent pregnancy (Cavazos-Rehg et al., 2010). Additional risk factors for adolescent pregnancy include early initiation of dating, early substance abuse, and dating older men (Talashek, Alba, & Patel, 2006). Young pregnant women are likely to be a product of teen pregnancy, and their babies are at increased risk of becoming a teenage parent later in life (Jutte et al., 2010; Klein & American Academy of Pediatrics Committee, 2005). With approximately 300,000 live births per year to adolescents, teen pregnancy remains an important social equity issue with consequences that span generations (Klein & American Academy of Pediatrics Committee, 2005).

In Allegheny County, PA, the teen birth rate is 24 per 1,000 females aged 15 to 19, and 6,868 adolescents gave birth in 2010 (County Health Rankings, 2010). This is lower than the Pennsylvania rate of teen births, 27 per 1,000, and the national rate for the US, where 34 adolescent females per 1,000 give birth every year (Centers for Disease Control and Prevention [CDC], 2012). Though rates of age-specific pregnancy have been declining since 1991 (Klein & American Academy of Pediatrics Committee, 2005), adolescent pregnancy remains a public health issue due to the high risk for adverse birth outcomes that young mothers experience (Bell, Zimmerman, Almgren, Mayer, & Huebner, 2006; Talashek, Alba, & Patel, 2006).

Babies of African American, minority, and low-socioeconomic status (a measure incorporating one's income, education, and occupation) adolescents experience elevated risk for preterm birth and low birth weight, common proxies for a variety of health and social disadvantages that start in early life (Chandra, Schiavello, Ravi, Weinstein, & Hook, 2002; Klein & American Academy of Pediatrics Committee, 2005). In Pennsylvania, 16.3% of births to Black teens younger than 18 were preterm versus 10.8% of preterm births to Non-Hispanic White teens, and the rates of very preterm births (where preterm births are greater than 32 weeks) were almost double among Blacks in this age group (CDC, 2013; Kramer, Cooper, Drews-Botsch, Waller, & Hogue, 2010). Though only 38% of adolescents live in poor or low-income families, this group represents 83% of live births to teens (Klein & American Academy of Pediatrics Committee, 2005).

The experiences of unintended pregnancy and negative birth outcomes have an influence on these young women, their children, families, and communities. In the following sections, how early exposure to disadvantage has the potential to influence health and social outcomes throughout the lives of young mothers and their children (Fiscella & Williams, 2004; Jutte et al.,

2010) is discussed. Social support is proposed as a promising ameliorating factor of adverse outcomes. This information highlights the importance of reviewing existing programs for pregnant and parenting adolescents with a strong social support component

2.1.1 Health Risks

Pregnant teens and their babies experience high rates of adverse medical outcomes that may manifest in the perinatal period through later life (Chandra et al., 2002; Jutte et al., 2010). Health outcomes are influenced by biological factors such as poor nutritional status, young chronological and gynecological age; and mediated by social and environmental factors such as race/ethnicity, poverty, and access to prenatal care (Chandra et al., 2002; Jutte et al., 2010). The adverse outcomes detailed in this section are often markedly pronounced in younger teens and young mothers from minority and low-income backgrounds (Phipps, Sowers, & DeMonner, 2002).

In terms of personal health, pregnant teens face increased risks of pregnancy-induced hypertension, anemia, obesity and gestational diabetes (Chandra et al., 2002; Klein & American Academy of Pediatrics Committee, 2005). Though maternal mortality rates for adolescents are low, they are twice those of adult women (Klein & American Academy of Pediatrics Committee, 2005). Young mothers also commonly report pre- and post-partum depression as well as other mental health issues that negatively impact maternal and child well being (see section 2.1.3. – Psychological Factors; Cox et al., 2008).

Age is an important factor influencing pregnancy outcomes, with mothers 15 or younger experiencing the worst birth outcomes compared to adult women, specifically in terms of

preterm birth (Chandra et al., 2002) and infant mortality (Phipps, Sowers, & DeMonner, 2002). Younger mothers most frequently report that they did not seek prenatal care or received inadequate care (Phipps, Sowers, & DeMonner, 2002).

Chandra, Schiavello, Ravi, Weinstein and Hook (2002) attribute adverse maternal health outcomes to trends in poor nutrition, drug and alcohol abuse, and emotional stressors, but these primarily behavioral factors do not explain the full picture of adolescent pregnancy. Significant influences on pregnancy health outcomes also include poverty, race and ethnicity, poor pregnancy weight gain, low levels of educational attainment, and suboptimal or inadequate prenatal care (Chandra et al., 2002; Klein & American Academy of Pediatrics Committee, 2005). Many pregnant teens face a number of the aforementioned risk factors, which is likely contributing to observed disparities in outcomes between groups.

Adolescent childbearing has been linked to a number of poor infant health outcomes, specifically early delivery, low birth weight, and infant mortality (Phipps, Sowers, & DeMonner, 2002), and risk of poor outcomes is elevated in minority populations (Hall, Moreau, & Trussell, 2011). Compared to full-term infants, preterm and smaller infants are more susceptible to adverse lifestyle exposures some teens may face during pregnancy, for example: drug use, unprotected sex leading to sexually transmitted infections (STIs), and alcohol abuse (Chandra et al., 2002). Babies born small or early are likely to be sicker in infancy and childhood (Klein & American Academy of Pediatrics Committee, 2005), and experience persistent risks for problems related to growth and development later in life, specifically lower IQ, poorer academic achievement, and more neurosensory impairment (Chandra et al. 2002).

Not only do children born to teen mothers suffer adverse medical and social outcomes, but subsequent children born after the mother reaches adulthood may also face a similar

magnitude of risk (Jutte et al., 2010). In one study cohort, children born to mothers who were teens or who had borne previous children as a teen experienced mortality rates two to four times higher than children of never teen mothers (Jutte et al, 2010). Rates of neonatal intensive care unit (NICU) admissions and childhood hospitalization were also double or more for children of adolescents than for children born to adult mothers (Fleming et al., 2013).

A study by Hall, Moreau, and Trussell (2011) reported that women who are young, minority, and/or economically disadvantaged have demonstrated lower utilization of reproductive health services than their wealthier White counterparts. This finding suggests that a lack of reliable sexual health information and contraceptive counseling may be contributing to higher pregnancy rates and more pregnancy complications seen in this underserved group. African American, minority, and lower socio-economic background teens experience lower access to healthcare when compared to their White and more privileged peers (Fiscella & Williams, 2004). Inequities in healthcare access and quality, which are inextricably linked to race/ethnicity and socioeconomic status, have contributed to disparities in overall health (Fiscella & Williams, 2004; Williams, 1998). For pregnant adolescents, poor access to health care services means a lack of quality prenatal and obstetrical care that may be needed in these often complicated pregnancies and births (Hall, Moreau, & Trussell, 2011; Klein & American Academy of Pediatrics Committee, 2005; Williams, 1998). Elevated levels of maternal pregnancy complications and poor infant health are complex problems for healthcare service providers, who should be familiar with the unique situation of the adolescents they serve (Klein, 2005).

2.1.2 Social Factors

Social factors such as educational attainment, socioeconomic status, and family structure play a part as both influencers and consequences of teen pregnancy in the lives of young mothers and their children (Jutte et al., 2010). This section explores the possible social influences and consequences faced by mothers, children, and families affected by high rates of adolescent pregnancy.

Though a small proportion of births in the nation are to teen mothers, these infants disproportionately experience negative outcomes later in life (DeSocio et al., 2013), such as failing to graduate from high school within six years of entering 9th grade, being taken into foster care services, or receiving an intervention from a child welfare agency (Jutte et al., 2010;). As these children reach young adulthood, they are more likely to receive income assistance or welfare services (Jutte et al., 2010), and to become teen parents themselves (DeSocio et al., 2013). This pattern perpetuates a cycle of disadvantage as the hardship of being an adolescent mother continuously affects the lives of their offspring into future generations (DeSocio et al., 2013). Poverty can be both a cause and a consequence of adolescent pregnancy and parenting, though adolescents from low socioeconomic backgrounds have higher rates of pregnancy than their peers (Fiscella & Williams, 2004). Generational effects have been found to persist across socioeconomic status and thus potentially affect all adolescent births (Jutte et al., 2010).

Talashak, Alba and Patel (2006) present a descriptive picture of health disparities using secondary data from a case control study of pregnant and never-been-pregnant minority inner city teens. This study examines girls' ethnic group status in the context of various individual and community level risk factors to create a predictive model. Young women from racial and ethnic

minority groups were found to be most vulnerable to first sexual activity at an early age, with pregnancy often following soon after (Talashek, Alba, & Patel, 2006). Though a few community level factors, such as violence, were included in the analysis the study lacked a truly multilevel approach that is necessary to gain a complete picture of the phenomena of teen pregnancy (Talashek, Alba, & Patel, 2006).

The neighborhood environment has been shown to affect maternal stress (Dole et al., 2003) and preterm birth (Bell et al., 2006), but has primarily been studied in adult or general populations. Studies of neighborhood segregation have yielded varied results of effects on pregnant women (including adolescents), depending on a complex interaction between multiple variables (Bell et al., 2006). Racial/ethnic segregation can be protective in the context of a politically active and socially cohesive neighborhood, and detrimental when present in an area of concentrated poverty and a lack of health and other resources (Bell et al., 2006).

Poor neighborhood quality, which could include discrimination and perceived neighborhood safety, has been a demonstrated concern potentially contributing to heightened maternal stress and poor outcomes (Dole et al., 2003). Urban adolescents living in poverty often grow up in single-parent, low socio-economic status households, in neighborhoods likely plagued by violence and substance abuse, and are at high risk for lower rates of academic achievement and low educational goals. This environment promotes risky sexual behaviors, and when coupled with poor sexual education it is not hard to see how a young woman might become pregnant (Talashek, Alba, & Patel, 2006).

Additional social consequences of adolescent pregnancy include separation or divorce from child's father, rapid repeat pregnancy, interruption of school completion, persistent poverty, and limited career opportunities (Klein & American Academy of Pediatrics Committee, 2005).

Maternal health status, stress, and behaviors are influenced by social and environmental factors (Dole et al., 2003). This complex variety of factors contributes to psychological well being, which impacts parenting self-efficacy and ability (Cosey & Bechtel, 2001), as well as the health and development of a child (Edwards et al., 2012). Comprehensive adolescent pregnancy programs and home-visitation programs have been shown to improve psychosocial outcomes in teen moms (Klein & American Academy of Pediatrics Committee, 2005).

2.1.3 Psychosocial Factors and Outcomes

Pregnancy is associated with a risk for adverse psychological issues such as stress and depression (Dole et al., 2003). Pregnant teens from disadvantaged backgrounds are more likely than adult women to experience the effects of stress, depression, and other mental health issues (Edwards et al., 2012), often without an appropriate coping mechanism or adequate social or medical support. The following section outlines the scope of psychological factors and their outcomes associated with adolescent pregnancy, many of which may be amenable to interventions with a strong social support component (Klein & American Academy of Pediatrics Committee, 2005).

High levels of reported isolation, loneliness, and depression have been demonstrated in adolescent mothers, creating negative impacts on maternal self-esteem, which is related to infant bonding and effective parenting (Cox et al., 2008). Among a number of psychological and mental health issues, depression has been most strongly demonstrated to interfere with positive parenting, nurturing abilities and overall life skills in adolescents (Cox et al., 2008; Dole et al., 2003). Teens who are depressed postpartum are at risk for later substance abuse, delinquency, and persistent mental health problems if not treated. Estimates of postpartum depression in

adolescents vary from 32% to 60%, and some studies show a 42% prevalence of mental health issues, including depression and stress, among pregnant teens (Cox et al., 2008).

The stress of an unplanned teen pregnancy takes a toll on the psychological well being of adolescent moms-to-be, who often lack the resources to cope with the multiple environmental, social, and biological stressors associated with pregnancy (Cosey & Bechtel, 2001). Additional factors contributing to stress in the lives of minority and low socioeconomic status adolescents may include poor neighborhood conditions (Kramer et al., 2010), residential segregation, structural and personal discrimination, substance abuse, and financial strain (Cavazos-Rehg et al., 2010; Talashek, Alba, & Patel, 2006). Unmitigated stress and anxiety can disrupt the healthy development of the babies born to teen mothers (Bell et al., 2006; Edwards et al., 2012).

African American teens, who often experience high-risk pregnancies, are in danger of heightened levels of stress and anxiety, which have been shown to have deleterious effects on birth outcomes (Chandra, Schiavello, Ravi, Weinstein, & Hook, 2002; Coffman & Ray, 2002). To make matters worse, racially structured inequality can make it difficult to obtain appropriate care tailored to their situation (Hall, Moreau, & Trussell, 2011), or at times any care at all (Cosey & Bechtel, 2001).

2.2 SOCIAL SUPPORT

Adequate social support has the potential to decrease depression and other negative emotions related to pregnancy (Coffman & Ray, 2002), diminishing the risk of later substance abuse, adverse life events, and persistent mental health issues that have been observed in parenting

teens (Cox et al., 2008). Maternal depression has been shown to put infants at risk for child maltreatment, delayed cognitive development, and behavioral problems by age three (Cox et al., 2008). The effects of supportive relationships in the pregnancy and post-partum periods have not been broadly studied in adolescents (Edwards et al., 2012). This section defines social support in the context of adolescent pregnancy and describes current literature on the topic.

Social support involves a well-intentioned action that is given willingly to a person with whom there is a personal relationship, and that produces an immediate or delayed positive response in recipient (Logsdon, Gagne, et al., 2005). Support may be formal, as through a government program or church service, or informal, sourced from friends, family, significant others and peers. Additionally, support may be provided in a variety of ways, expressed as material, informational, emotional and/or comparison support (Logsdon, Gagne, et al., 2005). The benefits of social support include decreasing stress and improving health outcomes for mom and baby (Cox et al., 2008; Edwards et al., 2012; Logsdon, Gagne, et al., 2005).

A supportive network is important to pregnant teens who face inherently adolescent challenges related to physical, emotional, and identity development in addition to preparing for their role as parents (Stevenson, Maton, & Teti, 1999). Adequate social support during pregnancy is associated with lower risk for maternal depression, and increased self-esteem and life satisfaction during the weeks and months postpartum in young mothers (Cosey & Bechtel, 2001; Stevenson et al., 1999). Adolescents are often ill prepared for the demands of pregnancy and impending parenthood, perceive few resources, and are stressed (Logsdon, Gagne, et al., 2005). A lack of social support, or not getting the support one needs, can exacerbate negative outcomes in pregnant women (Coffman & Ray, 2002).

High-risk pregnancies, most often observed in minority and low-income women (Klein & American Academy of Pediatrics Committee, 2005), are marked by increased vulnerability and heightened anxiety (Coffman & Ray, 2002), as well as other emotional and social factors that may influence outcomes. These emotional responses are amenable to supportive interventions: social support has been linked to a decrease in depression in low-income women postpartum (Coffman & Ray, 2002). Social support may stimulate positive neuro-endocrine responses that buffer the effects of stress in pregnancy (Bell et al., 2006), leading to better pregnancy and birth outcomes (Dole et al., 2003). Women who receive adequate social support, and are less stressed and anxious, may experience lower risk for pregnancy complications such as gestational diabetes and preeclampsia, preterm birth or birthing a low-birth-weight infant. Tangible and emotional support from various sources has been shown to increase well being among pregnant and parenting teens over time (Stevenson et al., 1999).

Informal support networks appear to be most common among parenting and pregnant adolescents, and the composition of networks varies depending on a number of characteristics such as age, race/ethnicity, and coresidence with infant's grandparents (Stevenson et al., 1999). Sources of support most often mentioned include mothers, boyfriends and peers, who provide help coping with the challenges of adolescent pregnancy and parenting (Stevenson et al., 1999). Family support networks, compared to nonfamily support from the health sector and community, have been shown to be especially beneficial to the well being of young mothers (Cosey & Bechtel, 2001). Supportive relationships with intimate partners and parents (usually but not always the teen's mother), have been shown to be effective in mitigating depressive symptoms in young African American mothers, and talking with other teen mothers can enhance support and decrease isolation (Cox et al., 2005).

Researchers have recommended additional study into the type of support used among African American teens and the extent to which this influences health outcomes (Logsdon et al., 2005; Stevenson et al., 1999). In the literature that is available, only a small proportion use qualitative methods to gain perspectives from pregnant adolescents on the negotiation and perceived benefits and barriers to social support (Logsdon et al., 2005; Stevenson et al., 1999).

The quality of social support received has an impact on the mental health of young moms and the healthy development of their infants (Stevenson et al., 1999). Logsdon, Gagne, Hughes, Patterson and Rakestraw (2005) described social support experiences as a metaphor of “piecing together a quilt” in the lives of pregnant and parenting adolescents. In focus groups, participants described the stress and challenges in their lives and how they piece together the support needed from what is available (Logsdon, Gagne, et al., 2005). In interviews about perceptions of social support in African American adult women with high-risk pregnancies, social support was seen as beneficial only when the expected or desired support was received (Coffman & Ray, 2002). The reciprocal exchange, or giving as well as receiving, of support and presence of positive relationships have been found to enhance social support and psychological well being in African American, pregnant adolescents (Coffman & Ray, 2002; Stevenson et al., 1999).

Factors such as socioeconomic status, relationship (or lack thereof) with father of child, and composition of family influenced the delivery and perceived effect of support (Logsdon et al., 2005). Furthermore, not all help given with good intention was perceived as supportive if the needs of the mother were not known and/or respected (Coffman & Ray, 2002). The limited qualitative research that is available in the literature is invaluable due to insights into the phenomenon of social support in pregnancy (Coffman & Ray, 2002; Herrman, 2006; Logsdon et al., 2005; Stevenson et al., 1999).

Social support has been shown to be effective in improving outcomes, and is a common component in teen pregnancy and parenting interventions, yet there is no comprehensive review of programs serving minority adolescents to inform programmatic, service, and funding decisions. This study expands the literature by providing a review of existing programs for minority pregnant and parenting teens with a strong social support component.

2.3 PUBLIC HEALTH RELEVANCE

The health and success of pregnant adolescents and their babies will impact the future health and success of America's next generations. Research into the quantity and quality of programs built to support pregnant adolescents will increase knowledge of the best practices for stakeholders aiming to improve maternal and child health in this vulnerable population, but there is a dearth of published literature available to inform decisions (Logsdon et al., 2005). The goal of this study was to systematically present and review the research literature available documenting the impact of adolescent pregnancy and parenting programs with a strong social support component.

Though the literature refers to contextual factors influencing adolescent pregnancy outcomes in African Americans, the available studies are not written from a health equity perspective. Many scholars have documented evidence of health disparities within this group (Bell et al., 2006; Chandra et al., 2002; Fiscella & Williams, 2004; Hall, Moreau, & Trussell, 2011; Koniak-Griffin, Lominska, & Brecht, 1993; M. Talashek, Alba, & Patel, 2006), but neglect to inspire action towards elimination of observed inequities (Alberti, Bonham, & Kirch, 2013). There has been an international shift towards making research publicly accessible outside

of universities and research institutions (Maggio, Steinberg, Moorhead, O'Brien, & Willinsky, 2013), including to agencies that provide services to the community. This manuscript will be made available to Pittsburgh agencies by request from the University of Pittsburgh's Center for Health Equity, along with a guide meant for community use. The public health relevance of this study is that it empowers local agencies serving pregnant teens with knowledge to assess the best practices in their field, and inform the implementation of new or existing program services.

3.0 METHODS

This thesis is based on literature identified through a systematic review, with the goal of presenting intervention studies to improve social support for pregnant adolescents. An intervention was considered to be “any kind of planned activity or group of activities... designed to prevent disease or injury or promote health in a group of people, about which a single conclusion can be drawn” (CDC, 2014). The details of the search strategy, inclusion and exclusion criteria, data extraction and article classification are presented in this section.

3.1 SEARCH STRATEGY

With the guidance of a University of Pittsburgh Health Sciences librarian with experience in systematic review processes, a search of the literature was conducted to identify intervention studies that promote social support among pregnant adolescents. PubMed (National Library of Medicine), CINAHL (EBSCO), and PsycINFO (Ovid) databases were searched to identify relevant studies. The development of search terms was guided by a preliminary review of the literature, and bibliographies of retrieved articles were reviewed to locate additional

studies. A complete list of search terms and medical subject headings used in PubMed, CINAHL, and PsycINFO databases can be found in Table 1 in Appendix A.

3.2 INCLUSION AND EXCLUSION CRITERIA

Studies were eligible for inclusion in the systematic review if: 1) they reported on an intervention with an explicitly stated social support component and/or outcome, 2) study activities began while participants were pregnant, and 3) study activities occurred in the United States. In order to identify the most modern and effective support interventions, studies were limited to those published after 1991. Studies must have also been available in the English language.

Participants in included studies must have been: 1) pregnant and/or parenting, 2) aged 14 to 19 at time of infant's birth, and 3) part of a minority group(s). Because minority and low-income women often experience different socioeconomic realities than their White peers (Williams, 1998), at least 40% of study participants must have been African American, Latina, American Indian/Alaskan Native, or part of another minority/low income group to be included in this study analysis.

Interventions were considered to include a strong social support component if 1) the term "social support" was explicitly stated within an aim, conceptual model, measure, or primary outcome of the study, or 2) the intervention was said to be comprehensive and included a

measure of social support, or 3) a main aim of the program or a specific component of a program was to enhance, support, build, or strengthen a participant's support network.

Excluded studies did not report on an intervention, reported on an intervention not aimed at pregnant teens, did not include enough minority or adolescent participants, focused on clinical rather than psychosocial outcomes, were not published in a peer-reviewed journal, or did not occur in the United States. Duplicate articles were removed.

3.3 INFORMATION EXTRACTION

The selection of information to be extracted was informed by guidelines from a review of support-education interventions for adolescent mothers (Letourneau, Stewart, & Barnfather, 2004). The information collected include the following: 1) program name, publications, and first author(s), 2) setting, 3) participant characteristics, 4) theoretical/conceptual basis, 5) program components, 6) intervention facilitators, 7) mode and frequency of intervention, and 8) reported outcomes. An information extraction table was created to record intervention characteristics, and an abridged version may be found at Table 2 in Appendix A.

3.4 CLASSIFICATION OF ARTICLES

After studies had been reviewed, it became clear that intervention setting influenced major characteristics of each study, notably intervention design, intensity, and outcome. This review is organized by four settings: clinical interventions, school-based interventions, community-based interventions, and comparison studies, which report on one or more interventions in multiple settings. In the case that intervention setting was not clearly stated, studies were grouped into the most appropriate category for the intervention type.

3.5 SELECTION OF ARTICLES

The literature search of articles published from 1991 to 2014 resulted in 585 hits for social support interventions in pregnant adolescents. Twenty-six of these articles were duplicates and were removed. Five hundred and fifty-nine title/abstracts were reviewed, and 437 were excluded because they did not describe an intervention (n=211), did not target pregnant adolescents (n=109), had no minority participants (n=1), did not have enough minority or teen participants (n=3), did not occur in the US (n=57), or described a clinical intervention with no social support component (n = 46). Of the 122 full text records that were reviewed for inclusion in the study, two records were not available via interlibrary loan, and 87 were excluded because they did not describe an intervention (n=12), did not target pregnant adolescents (n=25), did not have enough minority or teen participants (n=3), did not occur in the US (n=17), were not published in a peer-reviewed journal (n=2), or described a

clinical intervention with no social support component ($n = 25$). Finally, 33 publications were included in this review, reporting on 25 studies. A PRISMA flowchart of the screening and eligibility evaluation process can be found at Figure 1 in Appendix A.

4.0 RESULTS

Thirty-three publications were examined for this review, reporting on 25 interventions devoted to the promotion of social support among pregnant adolescents. Seven clinical, seven school-based, eight community-based, and three comparison study interventions are presented in this section, along with summaries of selected program characteristics.

4.1 CHARACTERISTICS OF INTERVENTION BY SETTING

4.1.1 Clinical Interventions

Clinical interventions occurred within a facility providing medical care, including interventions carried out in prenatal clinics (inclusive of adolescent-centered prenatal clinics), hospitals, school-based health clinics and university-based health centers. Seven clinical intervention studies are summarized in this review, reported on in eight publications. The programs to be summarized in this section are: the Comprehensive Young Parent Program (Comprehensive YPP) (Omar, Fowler, & McClanahan, 2008), Centering Pregnancy (Bloom, 2005; Grady & Bloom, 2004), the REACH (Relaxation, Encouragement, Appreciation, Communication,

Helpfulness) Program (Phipps, Raker, Ware, & Zlotnick, 2013), Teenage Mothers-Grandmothers Program (TAM-G) (Roye & Balk, 1996), a prenatal care intervention (Ford et al., 2002), Teen Fresh Start with a Buddy (TFS+B) (Albrecht, Payne, Stone, & Reynolds, 1998), and an integrated services program (Patchen, Letourneau, & Berggren, 2013).

Three studies provided a theoretical framework that guided them: social cognitive theory was used in Teen FreshStart with a Buddy (Albrecht et al., 1998; Ford et al., 2002), youth development theory was used in an Integrated Services Program (Patchen et al., 2013), and the problem-behavior theory was used in Teen FreshStart with a Buddy (Albrecht et al., 1998). The remaining four interventions were guided by previously published models and programs, including Centering Pregnancy (Bloom, 2005; Grady & Bloom, 2004) Comprehensive Young Parent Program (Omar et al., 2008), the REACH Program (Phipps et al., 2013) or literature informing program components (*TAM-G*, Roye & Balk, 1996). With one exception (*TFS+B*; Albrecht et al., 1998), each clinical intervention provided some pre- and post-partum care for the adolescent participant and her infant at the program site, and this medical care was a central component of many interventions (Bloom, 2005; Grady & Bloom, 2004; Omar et al., 2008; Patchen et al., 2013).

Common program components include: education about labor, delivery, and child development; family planning, sexuality, and contraceptive information; developing communication and conflict resolution skills; involving family members and supportive people from the adolescent participant's life; and building peer support through group activities. Some programs further supplemented services with nutrition resources (*TAM-G*; Roye & Balk, 1996), education completion support and job skills development (*Integrated Services Program*; Patchen et al., 2013), involvement of resource individuals providing a specific expertise

(*Centering Pregnancy*; Bloom, 2005), and goal setting for the future of mother and baby (*REACH Program*; Phipps et al., 2013).

Two interventions were particularly unique in their program offerings. The REACH Program provided intensive interpersonal therapy to pregnant adolescents with the goal of reducing the risk of postpartum depression (Phipps et al., 2013). Therapeutic group and individual sessions covered managing stress, recognizing depression versus baby blues, developing a support system and healthy relationships, and utilizing psychosocial resources (Phipps et al., 2013). Teen Fresh Start with a Buddy (Albrecht et al., 1998) used peer support to encourage smoking cessation in pregnant adolescents. With a non-smoking buddy, participants attended group sessions meant to build and enhance smoking cessation skills, bring awareness to the effects of smoking on pregnancy and the fetus, and provide motivational messages as well as general pregnancy and health education.

A majority of programs were facilitated, at least in part, by a licensed health professional; pediatric nurse practitioners, certified midwives, physicians, psychologists, social workers, and nutritionists delivered interventions (Bloom, 2005; Ford et al., 2002; Grady & Bloom, 2004; Omar et al., 2008; Patchen et al., 2013; Roye & Balk, 1996). Other facilitators included trained program personnel following a detailed manual for the REACH Program (Phipps et al., 2013), youth development specialists for an Integrated Services Program (Patchen et al., 2013), and peers as co-facilitators for a Prenatal Care Intervention (Ford et al., 2002). One intervention, Teen FreshStart with a Buddy, did not report the facilitator used (Albrecht et al., 1998), but noted that the program was meant to be conducted by a primary care provider.

Four of the seven studies reported conducting intervention activities with a combination of individual and group modes, and program frequency and intensity varied greatly across

programs. Most frequently, initial assessments, case management, and home visit sessions were completed individually, supplemented by group sessions focused on education and support (*Centering Pregnancy*, Bloom, 2005, Grady & Bloom, 2004; *REACH Program*, Phipps et al., 2013; *TAM-G*, Roye & Balk, 1996).

In *Centering Pregnancy* and the *Prenatal Care Intervention*, all activities including prenatal care, critical measurements such as fetal heart tones, weight and blood pressure, and health education in a group setting (Bloom, 2005; Ford et al., 2002; Grady & Bloom, 2004). In these programs, individual appointments were made only when a serious health problem was identified (Ford et al., 2002), or in the case of the initial assessment or a specific request (Bloom, 2005; Grady & Bloom, 2004). Two other programs, including the *Comprehensive Young Parent Program* and the *Integrated Services Program*, provided care on a primarily individual basis, tailoring services to each adolescent (Omar et al., 2008), and providing access to occasional group activities (Patchen et al., 2013).

Supportive individuals from participants' lives were most notably involved in the *Teen Fresh Start with a Buddy* (Albrecht et al., 1998) and *Teenage Mothers-Grandmothers* programs (Roye & Balk, 1996). The "buddy" involved in the smoking cessation program was a non-smoking female peer who may or may not have been pregnant and attended group sessions as a support person for the adolescent participant (Albrecht et al., 1998). "Grandmother" refers to the mother of the participating pregnant teenager (Roye & Balk, 1996), who attended one-on-one sessions with a social worker in addition to accompanying her daughter to prenatal appointments and group education sessions.

Reported outcomes varied and were connected with program goals. Clinical interventions reported significant reductions in subsequent teen pregnancy (*Prenatal Care Intervention*, Ford

et al., 2002; *Comprehensive YPP*, Omar et al., 2008; *Integrated Services Program*, Patchen et al., 2013), improved birth outcomes and clinic service utilization (*Prenatal Care Intervention*, Ford et al., 2002; *Centering Pregnancy*, Grady et al., 2004; Bloom, 2005), reductions in postpartum depression (*REACH Program*, Phipps et al., 2013), increased contraceptive use (*Integrated Services Program*, Patchen et al., 2013), and smoking cessation (*TFS+B*, Albrecht et al., 1998). Authors also reported learning outcomes, changes in relationship quality, educational status and attainment, and program satisfaction measures.

Reducing subsequent births was a priority in many studies, and participants in the Prenatal Care Intervention, the Comprehensive Young Parent Program, and Integrated Services Program experienced lower rates of repeat pregnancy and birth within one year, three years, and six months, respectively (Ford et al., 2002; Omar et al., 2008; Patchen et al., 2013). Adolescents who participated in the Comprehensive Young Parent Program experienced a notably low rate of repeat teen pregnancies - less than 1% at three years post birth follow-up (Omar et al., 2008). Participants in an Integrated Services Program also had a lower rate of subsequent births than local statistics and commonly used contraceptives at six months postpartum; 80% reported using a long-acting contraceptive, and 94.6% reported using some form of contraception to prevent pregnancy. The Prenatal Care Intervention was able to reduce the incidence of low birth weight (LBW) infants to 6.6% among participants v. 12.5% in a usual care group in addition to reduced subsequent births.

The REACH Program produced a significant 33% reduction in postpartum depression six weeks after birth among young mothers in a randomized control trial. Thirty percent of pregnant teens who participated in Teen FreshStart with a Buddy had quit smoking versus 16% of teens

who did not have a buddy or were in the usual care group, and more had reduced their cigarettes per day.

Centering Pregnancy and the Teenage Mothers-Grandmothers Program reported outcomes gathered from open-ended interviews and found that patients were largely satisfied with the services they had received (Bloom, 2005; Grady & Bloom, 2004; Roye et al., 1996). Centering Pregnancy participants noted the importance of knowing others in the same situation, while moms in the Teenage Mothers-Grandmothers program revealed that the intervention had healed relationships and increased communication between adolescent participants and their mother-figures.

4.1.2 School – Based Interventions

School-based interventions occurred within a school environment, and included interventions carried out at alternative schools for pregnant/parenting adolescents or mainstream public schools in urban or rural counties. Seven school-based intervention studies are included in this review, reported on in eight publications. The interventions to be summarized in this section are: The Second Chance Club (Key, Barbosa, & Owens, 2001; Key, O'Rourke, Judy, & McKinnon, 2005), Touchpoints (Percy & McIntyre, 2001), the Polly T. McCabe Center (Seitz & Apfel, 1994), the BEST (Breastfeeding Educated and Supported Teen) Club (Volpe & Bear, 2000), The Paquin School (Amin & Sato, 2004), the depression and social support intervention (Logsdon, Birkimer, Simpson, & Looney, 2005), and a nurturing alternative school program (Spear, 2002).

While included studies did not always report on a theoretical framework, school-based intervention were guided by the research literature on adolescent pregnancy programs and

services (Amin & Sato, 2004; Seitz & Apfel, 1994), social support needs (Logsdon, Gagne, et al., 2005), and factors influencing breastfeeding in multiethnic mothers (Volpe & Bear, 2000). Spear (2002) sought to fill a gap in the research literature by using an ethnographic approach to explore the day-to-day social and learning environment of an alternative school program for pregnant and parenting teens.

Five articles reported on an intervention occurring in an alternative school, which typically follow the same curriculum, school year, and policies as the district in which they are housed, with the addition of relevant health education and supervision, prenatal care on site or at a clinic with which it has an agreement, and a variety of case management services: the Paquin School (Amin & Sato, 2004), the depression and Social Support Intervention (Logsdon, Birkimer, et al., 2005), Touchpoints (Percy & McIntyre, 2001), the Polly T. McCabe Center (Seitz & Apfel, 1994), and a Nurturing Alternative School Program (Spear, 2002). Three of these studies assessed a comprehensive school model, including the provision of services such as childcare, transportation assistance, and counseling on family planning, education, and employment (Amin & Sato, 2004; Seitz & Apfel, 1994; Spear, 2002). Percy and McIntyre (2001) reported on a discussion-based child development course focused on infant states and behaviors in Touchpoints, while Logsdon, Birkimer, Simpson, and Looney (2005) reported on a video intervention meant to enhance social support resources in the Depression and Social Support Intervention.

Two programs offered to pregnant and parenting adolescents in a mainstream high school setting were the Second Chance Club (Key, Barbosa, & Owens, 2001; Key et al., 2005) and the BEST Club (Volpe & Bear, 2000). Both interventions occurred as a component of supportive services offered to pregnant and parenting students including education on child health and

parenting, as well as group support. This group support was a major component of the Second Chance Club, which also empowered participants to design and execute community outreach projects (Key, Barbosa, & Owens, 2001; Key et al., 2005). The BEST Club was comprised of comprehensive breastfeeding education sessions with ongoing support from a peer counselor and fellow student parents (Volpe & Bear, 2000).

Nurses were most frequently mentioned as a program facilitator or educator; school nurses, registered nurses, community health nurses and a pediatric nursing professor were involved in delivering school-based interventions (Amin & Sato, 2004; Percy & McIntyre, 2001; Seitz & Apfel, 1994; Spear, 2002; Volpe & Bear, 2000). Teachers and faculty also played an important role as facilitators and supportive mentors in school-based interventions (Amin & Sato, 2004; Seitz & Apfel, 1994; Spear, 2002). Racially matched social workers served as facilitators (*Second Chance Club*; Key, Barbosa, & Owens, 2001; Key et al., 2005) and program support personnel (*Polly T. McCabe Center*, Seitz & Apfel, 1994). Other program and participant support personnel included a breastfeeding peer counselor who provided weekly support visits to students choosing to breastfeed as in the BEST Club (Volpe & Bear, 2000), and trained program assistants as in the Depression and Social Support Intervention and Touchpoints (Logsdon et al., 2005; Percy & McIntyre, 2001).

Student participants were generally referred to an alternative or in-school program when their pregnancy became known to a teacher or counselor, and voluntarily enrolled in the program from as early as the first trimester until the end of the school term in which their baby was born (Amin & Sato, 2004; Seitz & Apfel, 1994; Spear, 2002). School-based interventions were largely carried out through group-based classes and activities (*The Paquin School*, Amin & Sato, 2004; *Touchpoints*, Percy & McIntyre, 2001; *BEST Club*; Volpe & Bear, 2000), and supplemented

with individualized case management, medical care, and additional support services (*Second Chance Club* ; Key, Barbosa, & Owens, 2001; Key et al., 2005; *Polly T. McCabe Center*, Seitz & Apfel, 1994).

There was variation in the outcomes studied within the included school-based intervention studies. Repeat teen birth was the main outcome of the Second Chance Club studies (Key, Barbosa, & Owens, 2001; Key et al., 2005), while Touchpoints measured parental competence (Percy & McIntyre, 2001), and the BEST Club focused on breastfeeding initiation (Volpe & Bear, 2000). Contraceptive use (*The Paquin School*; Amin & Sato, 2004), perceived social support (*Touchpoints*; Percy & McIntyre, 2001) depression (*DSS*; Logsdon et al., 2005), and infant weigh at birth (*Polly T. McCabe Center*; Seitz & Apfel, 1994) were also studied.

The Second Chance Club successfully prevented a repeat teen birth within three years in all but 6% of participants (Key, Barbosa, & Owens, 2001), and used an ecological design to confirm the efficacy of this secondary pregnancy prevention program (Key et al., 2005). Students attending the Polly T. McCabe Program from early in their pregnancy experienced a significantly lower incidence of preterm birth and low birth weight deliveries than those who entered late in pregnancy or were not enrolled in the alternative program (Seitz & Apfel, 1994). The Paquin School reported significantly higher use of contraception and long-acting contraception among young mothers who had been students there than among those who had completed their education at their public school or who were not attending school (Amin & Sato, 2004). About 65% of BEST Club participants reported initiating breastfeeding versus 14.6% in the comparison group, but follow-up information on breastfeeding duration was not collected (Volpe & Bear, 2000).

The Touchpoints curriculum produced improved scores on the Parenting Sense of Competence Scale, and participants reported feeling that the class was helpful and served as a space to freely share their experiences (Percy & McIntyre, 2001). Spear (2002) described the experiences of students, teachers, and faculty in a Nurturing Alternative School Program, uncovering themes of nurturing and positive regard, sisterhood and belonging, mentoring and a sense of family among facilitators and peers, and a proactive learning environment where academic pride is evident.

School-based interventions took place in either a mainstream or alternative public school and were successful at improving a range of desired outcomes. These programs promoted the group support inherent in their participants' shared experiences, and assisted young mothers with school completion and job skills training.

4.1.3 Community – Based Interventions

Community-based interventions were carried out in a variety of locations usually according to the preference of the participant, which included the home, a community space, or via cell phone communication in Girl Talk (Katz et al., 2011). Eight community-based intervention studies are included in this review, reported on in 14 publications. The community-based programs included The Young Parenthood Program (Florsheim et al., 2012; Florsheim, McArthur, Hudak, Heavin, & Burrow-Sanchez, 2011), an Early Intervention Program (Koniak-Griffin et al., 2002; Koniak-Griffin, Anderson, Verzemnieks, & Brecht, 2000; Koniak-Griffin, Mathenge, Anderson, & Verzemnieks, 1999; Koniak-Griffin et al., 2003), Resource Mothers Program (Rogers, Peoples-

Sheps, & Sorenson, 1995; Rogers, Peoples-Sheps, & Suchindran, 1996), Home Visiting and Primary Care (Barnet, Liu, DeVoe, Alperovitz-Bichell, & Duggan, 2007), Nurse Family Partnership (NFP) (Gray, Sheeder, O'Brien, & Stevens-Simon, 2006), a Home Visiting Intervention in American Indian (AI) Adolescents (Barlow et al., 2006; Ginsburg et al., 2008), The Pregnant and Parenting Teen Program (Schaffer, Goodhue, Stennes, & Lanigan, 2012), and Girl Talk (Katz et al., 2011).

Community-based program studies often reported a conceptual/theoretical framework that guided intervention activities and expected outcomes. The Nurse-Family Partnership model, based on an evidence-based intervention by Olds (2006) that draws from human ecology, self-efficacy, and human attachment theories, was frequently cited as contributing to study design (Gray et al., 2006; Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2003; Schaffer et al., 2012). Social cognitive theory (Barnet et al., 2007), and adolescent development theory (Katz et al., 2011) integrated with family systems theory (Florsheim et al., 2012; Florsheim et al., 2011) were also noted as providing theoretical guidance to intervention studies. The Resource Mothers Program was guided by the assumption that the provision of social support programs would improve pregnancy outcomes (Rogers et al., 1995; Rogers et al., 1996), while the Home Visiting Intervention in AI Adolescents was modeled after an American Academy of Pediatrics guide titled "Healthy Families America" (Barlow et al., 2006; Ginsburg et al., 2008).

Six community-based programs were home visiting interventions, and shared a number of main components including education about pregnancy, labor and delivery, infant care and development, and sexual and mental health: Home Visiting Intervention Among AI Adolescents (Barlow et al., 2006, Ginsburg et al., 2008), Home Visiting and Primary Care (Barnet et al.,

2007), NFP (Gray et al., 2006), Early Intervention Program (Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2003), Resources Mothers Program, (Rogers et al., 1995; Rogers et al., 1996) and the Pregnant and Parenting Team Program (Schaffer et al., 2012). Home visiting interventions involved a caring relationship between the adolescent participant and her baby and the home visitor, who often provided counseling on contraception and family planning, help with setting personal goals with an emphasis on school completion, interpersonal skills and social support enhancement, and general case management with linkages to relevant resources and primary care (Barlow et al., 2006; Barnett et al., 2007; Ginsburg et al., 2008; Gray et al., 2006; Jones & Mondy, 1994; Klerman et al., 2003; Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2003; Omar et al., 2008; Rogers et al., 1995; Rogers et al., 1996; Schaffer et al., 2012) .

The Girl Talk intervention provided services similar to those seen in home visiting interventions, using frequent mobile phone sessions to develop positive teen attitudes, improve communication with partners, family members, and other supportive individuals, increase knowledge of health risks, and delay additional childbearing (Katz et al., 2011). The Young Parenthood Program provided interpersonal counseling to pregnant adolescents with their partners to promote positive coparenting and a reduction in intimate partner violence (IPV) (Florsheim et al., 2012; Florsheim et al., 2011).

The NFP, the Early Intervention Program, and the Pregnant and Parenting Teen Program utilized registered public health nurses (Gray et al., 2006; Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2003; Schaffer et al., 2012) as program facilitators and support. Trained paraprofessional women who were usually culturally

matched to participants facilitated the Home Visiting Intervention in AI Adolescents and the Resource Mother's Program (Barlow et al., 2006; Barnett et al., 2007; Ginsburg et al., 2008; Rogers et al., 1995; Rogers et al., 1996), while The Young Parenthood Program and Girl Talk employed master's-level counselors (Florsheim et al., 2012; Florsheim et al., 2011; Katz et al., 2011).

Program activities were conducted primarily on an individualized basis, and program length ranged from ten weeks to over two years. Home visiting interventions were fairly frequent, with visits beginning during the first or second trimester of pregnancy and ending at six months post-birth in the Home Visiting Intervention for AI Adolescents (Barlow et al., 2006; Ginsburg et al., 2008), one year post-birth for the Early Intervention Program (Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2003; Rogers et al., 1995; Rogers et al., 1996), or when the participant's baby turned two years old as in the Home Visiting and Primary Care and NFP interventions (Barnett et al., 2007; Gray et al., 2006). The Early Intervention Program included a series of four "preparation for motherhood" classes in a group format as a supplement to home visits (Koniak-Griffin et al., 1999). The Young Parent Program was comprised of 10 weekly 75-minute partner therapy sessions (Florsheim et al., 2012; Florsheim et al., 2011), and Girl Talk provided about 42 individual mobile counseling sessions throughout 18 months postpartum (Katz et al., 2011).

A number of adolescent and infant outcomes were reported as part of community-based program evaluations, including a battery of maternal and infant pregnancy and birth outcomes, and clinical care utilization or hospitalization rates (Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2003; Rogers et al., 1995; Rogers et al., 1996; Schaffer et al., 2012). Repeat teen pregnancy and birth was a frequently reported

outcome (Gray et al., 2006; Katz et al., 2011; Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2003). Parenting knowledge and skills were reported for participants of Home Visiting and Primary Care (Barnet et al., 2007), and the Home Visiting Intervention for AI Adolescents, along with measures of social support and family conflict (Barlow et al., 2006; Ginsburg et al., 2008). The Young Parenthood Program measured the risk or incidence of IPV and parental involvement (Florsheim et al., 2011; Florsheim et al., 2012).

Programs based in the community were successful at improving infant outcomes; 95% of teens active in the Pregnant and Parenting Team Program delivered healthy, full-term infants (Schaffer et al., 2012). Infants born to mothers enrolled in the Early Intervention Program were generally born full term and with a healthy weight, experienced fewer days and incidents of hospitalization, and received the appropriate immunizations, results that were improved compared to teens receiving traditional public health nursing care (Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2003). The Resource Mother Program increased the proportion of teens receiving adequate prenatal care, and unmarried participants were less likely to deliver a preterm baby than comparison group counterparts (Rogers et al., 1995; Rogers et al., 1996).

Outcomes for repeat teen birth were promising; at two years follow-up Early Intervention Program participants experienced 15% fewer repeat teen births (Koniak-Griffin et al., 2003), and Gray et al. (2006) reported that teens enrolled in the Nurse Family Partnership that experienced a repeat pregnancy tended to not be using a contraceptive method at six months postpartum. Girl Talk increased the amount of time between a teen's first birth and a subsequent pregnancy, an effect seen among participants aged 15 to 17 (Katz et al., 2011).

Parenting scores for teens involved in the Home Visiting and Primary Care intervention increased from pre- to post- test, and participants were more than three times more likely to continue school after the birth of their baby (Barnet et al., 2007). Participants in the Pregnant and Parenting Team Program had higher school attendance and graduation rates at two years follow up (Schaffer et al., 2012). The Young Parenthood Program produced positive father involvement at 18 months post-birth as well as a significant reduction in the risk of intimate partner violence for a time following the birth of participants' babies, but these results were not sustained at later follow-up (Florsheim et al., 2011; Florsheim et al., 2012).

Community-based interventions were able to target myriad outcomes by providing support through a caring, knowledgeable and reliable facilitator while meeting young women where they are most comfortable. Home visiting interventions were most prevalent, often citing Olds' evidence-based Nurse Family Partnership model (Olds, 2006) as guiding program design. Case management, or providing linkages to relevant medical and social services, was another common feature of community-based programs. Researchers reported involving supportive family, friends, and peers in intervention activities when possible, but only the Young Parenthood Program focused on enhancing the relationship between the pregnant teen and her partner (Florsheim et al., 2012; Florsheim et al., 2011). Girl Talk utilizes a fairly innovative intervention approach by providing supportive services via mobile phones (Katz et al., 2011).

4.1.4 Comparison Studies

Three studies were determined to be comparison studies, and six programs were evaluated in these publications. The North Carolina Adolescent Parenting Program (APP) compared

outcomes in participants who entered the program while pregnant (pregnant-entry) to those who had enrolled after giving birth to their baby (parenting-entry) (Sangalang & Rounds, 2005). Jones and Mondy (1994) compared outcomes from a clinic-based program named Lifespan to those of a school-based program, and the Teenage Parent Welfare Demonstration (TPWD) was compared to home visiting and school-based interventions with similar goals (Klerman et al., 2003).

Comparison studies typically reported on previously published interventions or used secondary data, and a theoretical or conceptual basis was not reported for any included interventions. Jones and Mondy (1994) and Sangalang and Rounds (2005) did include a literature review within their publications, providing the context and relevance of their research.

The APP was a North Carolina-wide, community-based intervention that provided a combination of individualized case management and group meetings for adolescent parents (Sangalang & Rounds, 2005). The Lifespan program delivered an educational curriculum to groups at their prenatal care clinic, and was compared to a local public alternative school, or “Special School” for pregnant and parenting teens that provided prenatal care on-site (Jones & Mondy, 1994) similar to those described in section 4.2.2 – School-Based Interventions. TPWD provided case management, educational workshops and employment training, social support, childcare, and transportation assistance to low-income adolescent parents through a local welfare department (Klerman et al., 2003). Klerman, Baker, and Howard (2003) compared outcomes of the TPWD to the New Chance model in which a combination of schools and community-service organizations have provided similar services including personal and child development guidance, and a home visiting intervention with an emphasis on health and social services as well as promoting supportive services.

A variety of program facilitators were reported in comparison studies, including bachelor's- or master's-trained coordinators of the APP (Sangalang & Rounds, 2005), who were similar to the case managers or social service personnel delivering the TPWD and New Chance (Klerman et al., 2003). The home visiting intervention was facilitated by nurses (Klerman et al., 2003), who also likely played a part in the Special School, compared to trained volunteers who facilitated the Lifespan program (Jones & Mondy, 1994).

Though the frequency and mode of programs included in comparison studies was not always reported (Klerman et al., 2003), programs provided individualized medical care and/or case management supplemented with group education and support (Jones & Mondy, 1994; Sangalang & Rounds, 2005).

Repeat teen births was examined by Klerman, Baker and Howard (2003) and Jones and Mondy (1994), who also studied a number of prenatal, postpartum, and family planning clinic visits, high school completion, and selected infant health outcomes at five years follow-up. Most outcomes were similar for groups of participants, but a significant difference was noted in repeat teen births; the NFP was found to be most effective at delaying second pregnancy versus a community- or school-based program (Klerman et al., 2003). The APP program study focused on the outcomes of maternal substance use, contraceptive use, and parenting knowledge at one year follow-up, and found improved outcomes in all participants when compared to non-participants (Sangalang & Rounds, 2005). Contraceptive use and parenting knowledge were significantly increased in pregnant-entry, versus parenting-entry participants (Sangalang & Rounds, 2005).

Comparison studies may be useful to assess benefits and limitations of different intervention designs and methods. Outcomes for participants entering North Carolina's APP while pregnant were improved versus those who entered while already parenting, a finding that

supports previous research (Sangalang & Rounds, 2005). Interventions modeled on the NFP produced improved results in repeat teen births over selected community- and school-based programs (Klerman et al., 2003).

5.0 DISCUSSION

The purpose of this thesis was to present intervention studies to improve social support for pregnant adolescents. In order to meet this purpose, a systematic literature review of three databases was conducted, yielding 25 included programs reported on in 33 publications. The following section presents a summary of review findings by intervention setting, the limitations of these findings, and issues to be addressed in future research.

5.1 SUMMARY OF FINDINGS

The findings of this literature review suggest that there is a variety of valid interventions that provide supportive services to minority, pregnant youth in clinic-, school-, and community-based settings. Eight of the studies included were in community-based settings, followed closely by seven programs in school-based settings, and seven in a clinical setting. Many programs aimed to be comprehensive, providing access to medical care for teens and their babies, connections to social resources, and tools for self-sufficiency. Programs reported careful selection, thorough training, and adequate supervision of the facilitators directly providing services to pregnant teens. Supportive, caring, and well-trained facilitators should be available to

care for, counsel, and/or mentor young women as they adapt to the changes that accompany pregnancy, parenting and adulthood.

5.1.1 Clinical Interventions

Clinical interventions tended to focus on providing adequate prenatal and perinatal care to teens and their babies, were successful at reducing repeat teen pregnancy and birth, increased the frequency of healthy child clinic visits, and improved maternal mental health outcomes. Informational support was provided in the medical setting in the form of education and resources to enable a teen parent to be successful. Emotional support was also provided through more therapeutic interventions, as well as within programs fostering peer-support relationships between pregnant teens in a group setting.

Though participants of programs with a group component reported high levels of satisfaction (*TAM-G*, Roye et al., 1996; *Centering Pregnancy*, Grady et al., 2004; Bloom, 2005), Phipps et al. (2013) reported a change in the REACH Program design to accommodate individualized care due to requests from participants. Knowledge of target population preferences can be gained through qualitative formative research, and may be useful in promoting patient satisfaction.

5.1.2 School – Based Programs

School-based programs had a unique opportunity to provide intensive services along with education, and capitalize on the potential peer support that could be found among teens

sharing the same pregnancy and parenting experiences. Schools and school programs assisted their students in achieving academic and parenting success through the provision of tangible support, such as childcare and transportation to school and prenatal appointments, as well as informational education and employment support.

Interventions for pregnant and parenting students in a school setting were successful at increasing contraceptive use (*The Paquin School*, Amin & Sato, 2004), preventing repeat teen births (*Second Chance Club*, Key, Barbosa, & Owens, 2001), improving infant outcomes (*Polly T. McCabe Center*; Seitz & Apfel, 1994), and promoting breastfeeding (*BEST Club*; Volpe & Bear, 2000) among this group. Participants also expressed satisfaction and utility in involvement with school-based programs. More research is needed to identify an evidence-based and adaptable model for use in communities without these programs, as well as standardized evaluation measures for existing programs. It may also be important to follow up with parenting students, who usually return to their regular schools a season after giving birth (Spear, 2002). School administrators should seek to develop collaborative ties with other agencies in order to ensure sustainable provision of the comprehensive services that enable these programs to be successful (Amin and Sato, 2004).

5.1.3 Community – Based Programs

Community-based programs targeted many issues due to community needs and agency focus, and evidence-based home visiting interventions were most prevalent. Home visiting interventions provide informational and emotional support to assist adolescents through pregnancy and parenting experiences. Interventions that provided services in participants' homes or another space that they identify were largely successful at reaching

program goals. Participants experienced fewer repeat teen births (*Nurse Family Partnership*, Gray et al., 2006; *Girl Talk*, Katz et al., 2011; *Early Intervention Program*, Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2003) and improved infant outcomes (*Early Intervention Program*, Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2003; *Resource Mothers Program*, Rogers et al., 1995; Rogers et al., 1996; *Pregnant and Parenting Team Program*, Schaffer et al., 2012).

Programs that promoted healthy partner relationships were successful, and more programs should be replicated that engage young parents before their baby is born. Despite supportive programs, young mothers from minority populations continue to experience elevated risks of postpartum depression, repeat pregnancy, and fragmented social and medical services (Klein & American Academy of Pediatrics Committee, 2005).

5.2 LIMITATIONS

This systematic literature review has several limitations. Only three databases were searched, only articles available through the University of Pittsburgh University Library System or Health Sciences Library System were reviewed, and grey literature was not included in searches or review. There may be additional or unpublished, successful social support interventions that were not identified in this review.

The most common limitation of included literature is the absence of a true control group or the failure to use any comparison group, which limits the ability to assess the success of an

intervention. Only eight out of 25 interventions (*TFS+B*, Albrecht et al., 1998; *Home Visiting Intervention Among AI Adolescents*, Barlow et al., 2006; *Home Visiting and Primary Care Linkage*, Barnet et al., 2007; *Young Parenthood Program*, Florsheim et al., 2012, Florsheim et al., 2011; *Prenatal Care Intervention*, Ford et al., 2002; *Girl Talk*, Katz et al., 2011; *Early Intervention Program*, Koniak-Griffin et al., 2002, Koniak-Griffin et al., 2000, Koniak-Griffin et al., 1999, Koniak-Griffin et al., 2003; *REACH Program* Phipps et al., 2013) reported using a randomized control design, which is not surprising when considering the ethical issues an agency may face when deciding whether to deny potential benefits to control group participants. Many studies made an effort to provide some comparison group, reporting outcomes of a ‘usual care’ group or statistics from a geographically and demographically similar population. Studies also commonly reported high attrition and nonresponse rates. Participants who dropped out of a study or cannot be contacted for follow-up may have been fundamentally different than those who stayed enrolled and in touch in the program (Akinbami, Cheng, & Kornfeld, 2001). Programs should have a strategy in place to minimize loss to follow-up, which may include incentives for data collection and flexibility in data collection locations and methods (Patchen, Letourneau, & Berggren, 2013). Another limitation of the presented literature is the inability to account for or report the influence of services or activities outside of the program scope, which may have had an influence on outcomes. Research studies demonstrating positive impact are more likely to be published; this publication bias may overstate the benefits of programs with a strong social support component among pregnant teens.

5.3 DIRECTIONS FOR FUTURE RESEARCH

Future efforts should include the replication and evaluation of evidence-supported programs. Research should seek to identify program characteristics that are particularly effective at promoting desired outcomes. The acceptability of interventions may be maximized by tailoring program materials and delivery to be culturally appropriate and appealing to teens from different racial and ethnic backgrounds (Phipps et al., 2013). More qualitative research should be conducted in order to obtain valuable input and feedback from current and potential program participants to guide local program implementation. Some innovative social support programs have reported promising results in pregnant and parenting teens (Hudson, Elek, Westfall, Grabau, & Fleck, 1999; Katz et al., 2011). Interventions utilizing mobile devices, computers, or the World Wide Web may be able to target hard-to-reach adolescent populations in urban or rural areas, and should be further replicated and evaluated. Interestingly, only one intervention (Ford et al., 2002) included high school diploma or GED receipt as a reported outcome. Education is intrinsically tied to health, and pregnancy is a top contributor to female high school dropouts (Freudenberg & Ruglis, 2007); more needs to be learned about how to promote school completion for young women becoming mothers.

6.0 CONCLUSION

Though teen pregnancy has declined in recent years, disparities in outcomes of young White and minority mothers persist, and adolescent pregnancy remains an important social equity issue with consequences that span generations. A supportive social network has been shown to ameliorate negative symptoms in pregnant and parenting adolescents, decreasing the likelihood of depression (Cox et al., 2008; Edwards et al., 2012), demonstrating a positive effect on birth and parenting outcomes, and providing many other benefits to the well being of mom and baby (Coffman & Ray, 2002; Logsdon et al., 2005). Social support interventions have the potential to reduce the risk of mental health issues that influence parenting success in teen moms and development of their babies through the life course. A systematic search of supportive interventions yielded 25 social support programs among minority teens based in clinic, school, and community settings, as well as a few comparison studies. The findings of this review suggest that available programs have been successful at improving adolescent and infant health outcomes, increasing parental knowledge and comfort, enhancing relationships between teens and supportive individuals, and preventing repeat teen births, among a bevy of other positive outcomes. Successful programs should be implemented by local agencies hoping to improve outcomes in their population of pregnant teens, and should perform

formative and evaluative research inclusive of target participants' input if possible. As we move into an increasingly technology-driven future, interventions that provide supportive services via mobile or Internet interfaces should be evaluated for efficacy and effectiveness (Hudson et al., 1999).

APPENDIX

SYSTEMATIC REVIEW TABLES AND FIGURES



PRISMA 2009 Flow Diagram

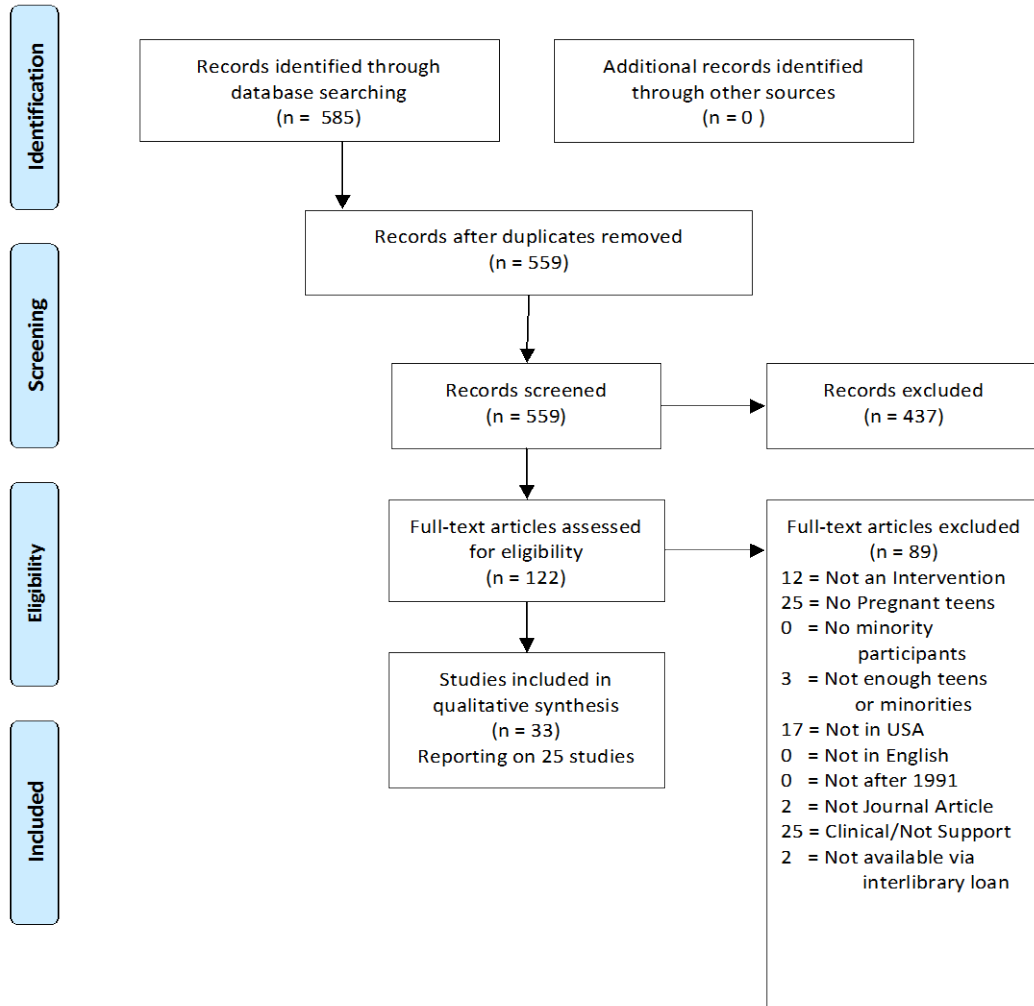


Figure 1. PRISMA Flow Diagram

Table 1. Search Terms Used in PubMed, PsycINFO and CINAHL

| Search Order | Search Terms Used |
|---------------------|--|
| S1 | "Pregnancy in Adolescence" OR "adolescent pregnancy" OR (“Pregnancy” AND “Adolescence”) |
| S2 | "social support" OR (MH "Support, Psychosocial") |
| S3 | S1 AND S2 |
| S4 | S1 AND (S2 OR "support") |
| S5 | S4 AND (program OR intervention) |
| S6 | S5 AND (family OR group OR church OR peer OR medical) |
| S7 | S5 AND (family OR group OR church OR peer OR medical OR prenatal) |

Table 2. Studies by Program Name and Setting

| Study name or identifier | Type of study | Number of publications |
|---|----------------------|-------------------------------|
| Young Parenthood Program | CB | 2 |
| Resource Mothers Program | CB | 2 |
| Early Intervention Program | CB | 4 |
| Pregnant & Parenting Team Program | CB | 1 |
| Teenage Parent Welfare Demonstration | CS | 1 |
| A Nurturing Alternative School Program | SB | 1 |
| Nurse Family Partnership | CB | 1 |
| Home Visiting & Primary Care | CB | 1 |
| Girl Talk | CB | 1 |
| Integrated Services Program | CI | 1 |
| Teen FreshStart with a buddy | CI | 1 |
| Teenage Mothers - Grandmothers | CI | 1 |
| REACH Program | CI | 1 |
| Comprehensive Young Parenting Program | CI | 1 |
| At Home Visiting | CB | 2 |
| Second Chance Club | SB | 2 |
| Touchpoints | SB | 1 |
| Polly T. McCabe Center | SB | 1 |
| BEST Club | SB | 1 |
| The Paquin School | SB | 1 |
| Depression & Social Support Intervention | SB | 1 |
| Centering Pregnancy | CI | 2 |
| Lifespan vs. Special School | CS | 1 |
| NC Adolescent Parenting Program | CS | 1 |
| Prenatal Care Intervention | CI | 1 |
| Totals for # of studies by type of studies & # of publications | | |
| Community-Based | 8 | 14 |
| Clinical Intervention | 7 | 8 |
| School-Based | 7 | 8 |
| Comparison Study | 3 | 3 |
| Total number of studies & number of publications | 25 | 33 |
| <i>Key</i> | | |
| Types of studies: | Abbreviation | |
| Community-Based | CB | |
| Clinical Intervention | CI | |
| School-Based | SB | |
| Comparison Study | CS | |

Table 3. Program Characteristics

| Program Name and First Author(s) | Location And Setting | Participant Characteristics | Theoretical/ Conceptual Basis | Program Components Supportive characteristics | Facilitators Who provided support? | Mode | Outcomes |
|---|--|--|---|--|--|--|---|
| Comprehensive Young Parent Program (Omar et al., 2008) | University-based health center | 1386 teen mothers between ages 11 – 19 50.4% Black, .6% Hispanic V. state statistics | Teen-Tot model - comprehensive care for mom & baby | Comprehensive care: for mom pre-, post partum & baby; Continuity of Care; flexible hours; financial incentive; extensive contraception counseling; routine phone/mail reminders | Physicians, nurses, social workers, nutritionist, psychologist | Varies according to adolescent's needs | Significant reduction in repeat teen pregnancy within 3 years - 11 (.79%) reported RTP No control group |
| Prenatal Care Intervention for Adolescent Mothers (Ford et al., 2002) | Detroit, Michigan Five clinics | 282 young mothers ages 13-21 94% African American, 2% Other usual care control group | Social Cognitive Theory | Scheduled mastery modeling, peer-support group, education & educational materials | Peers (take vitals), "nurse practitioner or other health professional" | Group | LBW 6.6% v 12.5; pregnancy within a year 15.8 v 20.4, working status, low school attendance in both groups <50% response at 1yr follow-up |
| Centering Pregnancy (Grady et al., 2004; Bloom, 2005) | St. Louis Teen Pregnancy Center at hospital School-based health clinic | 124 pregnant teens; 93.6% African American, 1% other | Previously tested model, developed by clinician - no theory specified | Care, Education & Support; topics: pregnancy issues, nutrition, childbirth prep, infant care, communication Peer assistants (as role model), family support Formal and informal educational discussion, involvement of resource people that provide specific expertise | 3 certified midwives, social worker, nutritionist, RN, education coordinator, secretary, medical assistant; practitioner and assistant (nurse) | group of 8-12, 12 total sessions every 4 wks for first 4 months then every 2 weeks, group prenatal assessments "other moms-to-be were feeling the same" | 87% returned for postpartum visit positive pregnancy outcomes, low rates of PTB, LBW 10.34% RTP at 1yr patients satisfied with care; 100% participation in Centering group-open-ended interviews |

Table 3 continued

| Program Name and First Author(s) | Location And Setting | Participant Characteristics | Theoretical/ Conceptual Basis | Program Components | Facilitator | Mode | Outcomes |
|--|---|---|--|--|--|---|---|
| REACH Program (Phipps et al., 2013) | Providence, Rhode Island Prenatal clinic | 54 teens ages 13- 18; 53.7% Hispanic, 16.7% Black v. didactic class | based on an program found to reduce post partum depression in adults on public assistance Culturally tailored focus-group inquiry Baby Basics book as resource | Intensive interpersonal therapy - effective communication /conflict resolution skills, expectations of motherhood, stress management, baby blues v depression, development of support system & healthy relationships, goal setting, psychosocial resources | facilitator used detailed program manual | Group & Individual - 5 sessions 1x/wk pre-birth, postpartum booster session | Postpartum depression (PPD) was significantly lower - 33% reduction in PPD risk Pilot study; randomized |
| Teenage Mothers-Grandmothers Program (TAM-G) (Roye et al., 1996) | Bronx, NY Adolescent prenatal clinic | 154 women ages 13 - 17, 57.1% Puerto Rican, 23% Black, 10.6% Hispanic v. teens in same program w/o Grandmother | intervention based on literature suggesting grandmother support is critical to teen mom success | Grandmother- teen pair; Educational sessions on: labor and delivery, changes in pregnancy, STDSs and aids prevention, teen concerns, sexuality and family planning, infant care, emotional needs of children, nutrition informal support group | pediatric nurse practitioner, social worker "someone cared...before and after [the birth]" | prenatal care & group classes biweekly until last semester, weekly in last 2 months- Grandmother attend 4 1-on-1 sessions 3rd includes teen mom | TAM-G teens sig. less likely to drop out of school; higher self esteem scores; trend towards lower-repeat pregnancy Open ended interviews expressed satisfaction |
| Integrated Services Program to Prevent Subsequent Birth (Patchen et al., 2013) | Washington, D.C. Hospital based & community based health centers | 187 pregnant teens ages 12-18, 61.3% AA, 36.5% Hispanic | Youth development theoretical framework | Address immediate need for medical care; provide psychological, social, and emotional support through activities; assist with education continuation and completion, job skills development Multiple points of access to services | Medical provider (midwife or physician), licensed social worker, + at least one other (youth development specialist, nurse health educator, counselor) | Individual health education and case management, plus access to group activities | Successful at preventing subsequent teen pregnancy and birth: 8% of subsequent births among participants Promoted contraceptive utilization: 94.6% reported use of contraceptive; 80.6% using long-acting reversible contraception at 6 months no suitable comparison group |

Table 3 continued

| Program Name and First Author(s) | Location And Setting | Participant Characteristics | Theoretical/ Conceptual Basis | Program Components | Facilitator | Mode | Outcomes |
|---|--|---|---|--|---|--|---|
| Teen FreshStart with a Buddy (TFS+B) Program (Albrecht et al., 1998) | University of Pittsburgh | 46 teens 12-20 years old who report smoking and are pregnant TFS minus buddy, usual care combined comparison | Problem - behavior theory, cognitive behavior, developed by American Cancer Society | Heighten awareness and attention to smoking cessation, motivational messages, build/enhance smoking cessation skills, effects of smoking on pregnancy and fetus, body image changes and overall health | Not reported - meant to be administered in primary care by nurse or physician | Eight group sessions with non-smoking peer "buddy" | smoking cessation: 30% quit in +Buddy group v 16% TFS+B smoked 4 fewer cigarettes/day Small sample, high dropout |
| The Second Chance Club (Key, Barbosa, & Owens, 2001; Key et al, 2005) | urban public high school | 50 pregnant or parenting AA HS students | not reported | parenting, career planning, adolescent issues and group support; participation in school events such as a club; individual case mgmt and one home visit; medical care for adolescent and infant off site; student selected service projects providing outreach to community and at-risk middle school girls- | Project coordinator trained as social worker, racially and culturally matched | weekly group meetings throughout school year, 1 individual home visit and some case mgmt | Successfully prevented repeat birth at 3y follow-up, 6% in participants v. 37% control Program effective at keeping RTP low during intervention phase v. matched zip codes |
| Touchpoints (Percy et al., 2001) | rural TX alternative HS for parenting teens | Convenience sample of 20 pregnant/ parenting students | developmental/relational approach to teaching child development | Curriculum focusing on infant states and behaviors/ development used as guide for 1- semester child development course. Iterative course focused on student issues - encouraged to discuss hopes, fears, and frustrations as parents | PI - pediatric nursing professor, 2 research assistants (PhD, MA prepared community health nurse) | Once-weekly class meeting following guided interview format | Class improved on parenting sense of competence scale (PSOC) Open ended responses: "helpful" "you can talk about anything" |

Table 3 continued

| Program Name and First Author(s) | Location And Setting | Participant Characteristics | Theoretical/ Conceptual Basis | Program Components | Facilitator | Mode | Outcomes |
|---|--|--|--|--|--|---|---|
| The Polly T. McCabe Center (Seitz et al., 1994) | New Haven, CT alternative school for pregnant and parenting teens | 1-year birth cohort of students mid-gestation entry v. later entry | likened setting where pregnant teens were supervised by nurses 5 days of week to Olds et al home visiting intervention | regular school district calendar, schedule, and curriculum; social and medical services off site ; comprehensive approach | teachers, nurses, and social workers of mixed ethnic/racial composition | alternative school, daily attendance from when pregnancy is made known until semester of child's birth; | Sig. lower incidence of PTB, LBW deliveries in students attending McCabe from mid-gestation, v. later |
| The BEST Club (Volpe et al., 2000) | Brevard County, FL High School program developed for pregnant teens | pregnant*/parenting students ages 14 – 19 n= 43 control group, n=48 | based on literature on factors affecting multiethnic adult breastfeeding | [In addition to academic course work, courses like childbirth prep, CPR, infant care, series of parenting classes; on-site daycare] 3 comprehensive breastfeeding education sessions & support | certified lactation consultant RN instructor, breastfeeding peer counselor | 3x/week 1 hr group sessions | 65.1% reported breastfeeding initiation v. 14.6% no follow-up |
| The Paquin School Program (Amin et al., 2004) | Baltimore, MD public school for pregnant/parenting teens | 371 pregnant/parenting students | assumption that adolescents often receive fragmented services, while comprehensive approach yields benefits | Alternative comprehensive school program; educational and employment counseling services, parenting education, transport assistance, child care, school clinic services, family planning info and services - medical care off site | school personnel, nurses | School-wide | Higher use of contraception (86.7 v. 77.4), more long-acting contraception use (56.9 % v. 45.8) in Paquin School students |
| Depression and Social Support Intervention (Logsdon et al., 2005) | alternative school for pregnant and parenting teens | 128 pregnant teens enrolled in alt school; 56% African American, 6% other comparison group not enrolled in alternative school | based on lit synthesis of support needed - dual coding theory | [Within school's program which offered transportation, child care, health services, and minimal individual counseling;] Social support intervention, pamphlet and video addressing various aspects of support | research assistant | 1 - time video watch & take-home pamphlet | Did not decrease symptoms of PPD at 6w postpartum |

Table 3 continued

| Program Name and First Author(s) | Location And Setting | Participant Characteristics | Theoretical/ Conceptual Basis | Program Components | Facilitator | Mode | Outcomes |
|---|---|---|---|---|--|--|---|
| Reading, Writing, and Having Babies: a Nurturing Alternative School Program (Spear, 2002) | Southeastern US alternative school for pregnant and parenting teens | majority AA pregnant and parenting students ages 12 - 19 | ethnographic approach | School offered district curriculum as well as tailored health course info, , child care, a couple home visits | faculty, school nurse "The teachers care.. and accept me" | daily attendance from when pregnancy is made known until semester of child's birth | Emergent themes: nurture and positive regard; sisterhood and belonging; mentoring and family; proactive learning and academic pride |
| The Young Parenthood Program (Florsheim et al., 2011; Florsheim et al., 2012) | Community-based, client-centered preference for prenatal clinic, community setting, or home | 105 pregnant teen-partner couples 50% Latina 14-18yrs | Integration of family systems theory and adolescent development theory | development of interpersonal skills needed for positive coparenting and parenting > child development customized to needs and circumstances of couple | Masters trained clinicians (grad students) - counselors | 75 min, 1x/week x 10 wks with couples | Positive father involvement at 18m post-birth Significant reduction in risk of IPV after birth – results were not sustained at second follow-up small sample |
| Early Intervention Program (Koniak-Griffin et al., 1999; Koniak-Griffin et al., 2000; Koniak-Griffin et al., 2002; Koniak-Griffin et al., 2003) | home visiting intervention | majority Latina and African American pregnant teens ages 14- 19 compared to similar teens receiving traditional public health nursing care | Drew from Olds NFP- Human ecology theory, self-efficacy, human attachment | Federally funded Case management Preparation for motherhood classes: Health, Life Skills, Sexuality & Family planning; Maternal Role; Social Support Systems Videotape instruction and feedback Regular phone calls | public health nurse | series for 4 group classes 6hrs t ; ~17 home visits,2.5 hrs/visit from pregnancy thru infant yr1 | Fewer days of infant hosp. at 6m, low rates of PTB and LBW in both groups; Significantly fewer days/incidents of infant hospitalization Increased infant immunization At 2yrs, 15% fewer PTB in EIP |

Table 3 continued

| Program Name and First Author(s) | Location And Setting | Participant Characteristics | Theoretical/ Conceptual Basis | Program Components | Facilitator | Mode | Outcomes |
|--|---|--|--|--|--|---|---|
| Resource Mother Program (RMP) (Rogers et al.1995; Rogers et al., 1996) | home visiting intervention run by state w mixed funds | >75% African American, under 18 pilot (n= 575) scaled up project (n=1901) comparison (n=4613) | Assumption: social support services will improve pregnancy outcomes | facilitate use of prenatal and social support services, provide education and reduce risk factors e.g. smoking; flexible based on needs | "Resource Mothers" - paraprofessional women selected from community employed full time, 3-6wks intensive training, supervision | monthly home visits during pregnancy, at hospital, thru yr1 | Adequacy of prenatal care was improved, Participants initiated care earlier, Unmarried teens in RMP less likely to have PTB than in comparison group |
| Home Visiting and Primary Care (Barnet et al., 2007) | home visiting intervention in Baltimore | 84 teens ages 12-18, predominately African American | Social Cognitive Theory | parenting curriculum, adolescent curriculum for health issues | 1 of 3 female African Americans, 2 days training and ongoing | bi-weekly from 3T to yr1, then monthly till yr2 | Parenting scores for home-visited teens was 5.5 pts. higher, participants 3.5 times more likely to continue school No effect on primary care linkage |
| Nurse Family Partnership (NFP) (Gray et al., 2006) | home visiting intervention -Nurse Family Partnership | 111 pregnant teens 18% Black, 54.1% Hispanic | Olds NFP model - Human ecology theory, self-efficacy, human attachment | Optimize: pregnancy outcomes by help women improve health-related behaviors; child health & development by help parents provide competent care; maternal life course development by help women develop a vision for future | Registered nurse, "helping professional" | weekly 4 wks after enrollment, every 2 wks till delivery, weekly 4wks after delivery, bi-weekly thru 21 wks post birth, monthly till 2yrs | Teens experiencing a repeat pregnancy tended to not be using a contraceptive method 6m postpartum, adequate family planning counseling not reporting |

Table 3 continued

| Program Name and First Author(s) | Location And Setting | Participant Characteristics | Theoretical/ Conceptual Basis | Program Components | Facilitator | Mode | Outcomes |
|--|--|--|---|---|---|---|---|
| Home Visiting Intervention Among American Indian (AI) Adolescents (Barlow et al., 2006; Ginsberg et al., 2008) | home visiting intervention | 53 pregnant American Indian adolescents ages 12-19 | Modeled on "Healthy Families America", Based on AAP Guide to Baby Care, Caring for your baby & young child, birth - 5yrs | Prenatal care, labor & delivery, breastfeeding & nutrition, parenting, infant care, family planning, STD prevention and maternal goal setting for personal/family development Family strengthening | AI women with 500 hrs training & personal experience or interest in population | 25 home visits including 41 discrete lessons - 28wks gestation to 6mth post-birth | Significantly higher parental knowledge and involvement scores, 2 & 6 mths postpartum Elevated risk of depression among AI participants low response rate, high dropout |
| Pregnant and Parenting Team Program (Schaffer et al., 2012) | home visiting intervention | 45% AA, 27% Hispanic, also White, Asian, AI, African - pregnant under 20 | based on effective programs in lit | a trusting relationship w PHN (case mgmt, service coordination); outreach and coordination w schools; a comprehensive and intensive maternal mental health curriculum; community support and caring thru provision of essential items needed for parenting success (cribs, warm clothing, transport assist) | public health nurse, may also be assigned trained paraprofessional to assist w community linkages | scheduled, protocols visits in home or community site; frequency not reported | 95% of participants with >5 HV had healthy full-term births (v. 91%), higher school attendance and graduation rates in program group at 2yrs post-birth, high teen satisfaction |
| Girl Talk (Katz et al., 2011) | Washington, D.C. Community-based - contact thru cell phones | 124 AA or Latina teens aged 15-19 (or still in H.S) v. 125 usual care | schema based on social -contextual factors related to teen development and influencing pregnancy spacing focused on teen's own goals and needs | to improve reproductive health planning and delay further childbearing - build knowledge of health risks, developing positive teen attitudes& skills for future self-regulation & orientation. Improve partner communication, resist peer pressure, increase connectedness w family, health provider, school, work. | Counselors-matched, Master's-level young women Program manual Workbook w visual aids provided | 42 calls over 18m postpartum | Intervention increased time to RTP, effect seen in teens aged 15-17 Small sample, new model |

Table 3 continued

| Program Name and First Author(s) | Location And Setting | Participant Characteristics | Theoretical/ Conceptual Basis | Program Components | Facilitator | Mode | Outcomes |
|---|--|--|--------------------------------------|---|---|--|---|
| North Carolina's adolescent parenting program (APP) (Sangalang et al, 2005) | Comparison study: Pregnant entry v. parenting entry - state-wide program, community-based | 91 pregnant/ parenting adolescents aged 12 to 18 years pregnant at entry n=52 | not reported | Services to lead to personal self-sufficiency and economic self support. Emphasis on strengthen/establish support system, preserve family stability, develop effective parenting skills, prevent child abuse and neglect | AAP coordinators (BS educated in social work, psychology, sociology, related; or Masters educated)- 18 hrs of in service training | Direct case management 3-4 times/m, occasional group mtgs | Outcome improved for both groups, sig. higher contraceptive use, sig. increase in parenting knowledge in pregnant-entry participants |
| Teenage Parent Welfare Demonstration (TPWD) Project (Klerman et al, 2003) | comparison study: - teenage parent welfare demo (community) - New Chance (school & municipal) - Home Visitation | >50% Black in all programs but one; TPWD & NC for mothers, HV starts in pregnancy | not reported | TPWD: Case mgmt, educational workshops & training, employment & social support, childcare, transportation help offered thru welfare dept. NC: Case mgmt, personal & child development, employment prep, childcare. HV: emphasis on health & social services, promoting supportive relationships | TPWD & NC: case managers or social service people. HV: nurses | differed, but not reported | Home visitation produced sig. reduction in RTP at 2y, 36m , 45m Survival analysis |
| Lifespan v Special School (Jones et al, 1994) | comparison study - a special school, or administered in-clinic during prenatal care | Lifespan =37, Special school = 71 | not reported | Lifespan is educational support offered at time of prenatal clinic v. Special school for pregnant/ parenting teens who receive prenatal care on-site | trained volunteers delivered Lifespan; nurse practitioners in school setting | Lifespan: group educational sessions, trained postnatal visitation volunteer with incentives; Special school: topics pertinent to pregnancy as well as on-site prenatal care | No sig. differences in # of births, # of prenatal visits, or birth weight between groups; RTB was frequent Low response rate for follow-up |

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