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REVIEW ARTICLE

Adolescent Mothers: Support Needs, Resources, and Support-Education Interventions

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Adolescent mothers are prone to live in poor conditions, lack adequate financial resources, suffer high stress, encounter family instability, and have limited educational opportunities. These factors contribute to inadequate parent-child interactions and diminished infant development. Social support can promote successful adaptation for adolescent mothers and their children. This review article describes the support needs and challenges faced by adolescent parents and their children, the support resources available to and accessed by adolescent parents, and existing support-education intervention studies, to provide directions for future research. Relevant research published between January 1982 and February 2003 was obtained from online database indices and retrieved article bibliographies. Frequently encountered problems included small sample sizes and attrition, lack of suitable comparison groups, and measurement inconsistencies. When planning support-education interventions, content, duration, intensity, mode, level, intervention agents, and targets should be considered. Future research can address these challenges. © ***Society for Adolescent Medicine, 2004***

KEY WORDS:
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Adolescent mothers and their children frequently live under conditions of high stress, poverty, limited educational opportunities, and family instability [1–5]. Despite such adversity, some young mothers go on to lead highly productive lives and facilitate their own and their children's development [6–8]. Unfortunately, this outcome is not the norm. Social support is a key factor when young mothers and their children succeed in spite of major challenges [9].

The social context of the mother-child relationship interacts with the personal characteristics of adolescent mothers to influence parenting and subsequent child development [10,11]. As a result, adolescent parents' effectiveness is challenged if their social support is limited. Significant decreases in social support for adolescent mothers have been reported when their infants are between 6 and 18 months of age [12]. The quality of care-giving that infants receive during this period is widely regarded as crucial for optimal long-term child development [13–15]. The threat to care-giving imposed by adolescent mothers' limited psychosocial resources may be buffered by a supportive family environment, partner, or professional [9,11].

The purposes of this review article are to: (a) describe the support needs and challenges faced by adolescent parents and their children; (b) describe the support resources available to and accessed by adolescent parents; and (c) review relevant support-education intervention studies to provide directions for future research.

Medical, health, psychological, and education database indices (CINAHL, MEDLINE, Psych Info, ERIC, and Healthstar) were reviewed from January

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Table 1. Published Support Intervention Studies

Study	Sample Size	Theoretical Foundation	Type of Support Intervention	Source of Support/ Support Agent	Mode	Duration	Frequency of Intervention	Reported Outcomes
Post-hoc evaluation of existing programs								
Doetsch [115]	$n = 58$	Social learning	Informational support: parenting skills training	Professionals: social workers	Group	6 weeks	Weekly sessions	*Prepare adolescents for parenthood *Increases in empathy and positive reinforcement of child behavior
Ferguson [110] 'Grads Program' (Graduation, reality, and dual role skills)	$n = 1281$	Social learning	Informational support: education re child development, parenting, and goal setting	Professionals: teachers (classes) home economist (home visits)	Group and one-on-one	10 months	Daily classes	*Maintain enrollment until graduation
							Weekly visits	*Drop out rates were 12% compared to national average of 80% for this sample
							Scheduled activities	
Flynn [121] 'Adolescent Parenting Program'	$n = 137$	Social learning and social exchange	Informational support: parenting skills training	Professionals: community health nurses paraprofessionals: nurse-mentors indigenous to community	One-on-one	2 years	Weekly mentor contact	*Improved infant health outcomes
			Affirmation/ emotional: mentorship				Monthly visits to community health nurse	*Children in sample were more likely to be immunized than national sample data
Roundtree [118] 'SOLVE Adolescent Mothers Program'	$n = 20$	Social learning	Informational support: child development workshops	Professionals: nutritionist home economist	Group	6 weeks	Weekly	*Improve mother's understanding of cognitive, physical, and emotional development *80% of participants demonstrated an increase in knowledge

Table 1. continued

Study	Sample Size	Theoretical Foundation	Type of Support Intervention	Source of Support/ Support Agent	Mode	Duration	Frequency of Intervention	Reported Outcomes
Weinman, Schreiber, and Robinson [108] 'Parent Education Program'	$n = 73$	Social learning, social exchange, and social comparison	Informational support: child development, parenting, life-skills	Peer volunteers: positive adult role models & program graduates	Group and one-on-one	8 weeks (24 sessions)	3 sessions a week	*Prevention of child abuse
			Affirmation/ emotional support: peer feedback					*More positive parenting attitudes
								*Increased parenting knowledge
Quasi-experimental intervention studies								
Censullo [113] 'Interaction Coaching for Adolescent Parents and Their Infants'	$n = 12$	Social learning	Informational support: child development	Professionals: nurses	Group	4 weeks	Two weeks in a row, off for one week, final session	*Increase adolescent/ infant interaction
			Affirmation support: practice and feedback					*Increased responsiveness and self-esteem scores
Cooper, Dunst, and Vance [124]	$n = 19$	Social learning	Informational/ affirmation support: modeling and reinforcing optimal parent-child interactions	Professionals: day care staff	Group and one-on-one	20 weeks	Weekly group sessions	*Increased parent child interaction
				Volunteers: parent volunteers			Weekly mentor contact	*Older teens increased frequency of responsive behaviours
Delatte, Orgeron, and Preis [70] 'Project SCAN'	$n = 170$	Social learning	Informational support: education re parenting, infant care, empathy toward children, child development, child abuse, family life and community resources	Professionals: social worker home economics teacher	Group	3 years	One semester (10 months): Daily sessions	*Facilitate smooth transition to parenthood
			Emotional support: group counseling				Weekly group sessions	*Large drop-out rate among control group

Table 1. continued

Study	Sample Size	Theoretical Foundation	Type of Support Intervention	Source of Support/ Support Agent	Mode	Duration	Frequency of Intervention	Reported Outcomes
Fulton and Murphy [93] 'Adolescent Parenting Program'	$n = 76$	Social learning	Informational support: parenting skills	Professionals: nurses	One-on-one	4–6 months	Alternating weekly home visits and clinic visits	*Improve knowledge of child development
			Instrumental support: links to community services					*Decreased potential for child abuse
Griffin [98] 'Teen Parent Support Program'	$n = 28$	Social learning, social exchange, and social comparison (self-efficacy and resiliency)	Informational support: classes on parenting and child development	Professionals: nurse school counselor	Group and one-on-one	5 years	Weekly	*Decrease school dropout rate
			Instrumental: day care service	Mentors: former program recipients, church members				
			Affirmation/emotional support: counseling and parent support group					
Koniak-Griffin et al. [122, 123] 'Early Intervention Program'	$n = 121$	Social learning	Informational support: family planning, life skills, postpartum care education	Professionals: public health nurses	One-on-one and group	1 year	4 parental classes 17 home visits	*Increased parental protective behaviors
Marsh and Wirick [107] 'Teen pregnancy and parenting program'	$n = 335$	Social learning	Informational support: life skills and parenting classes, employability training	Professionals: service providers	Group and one-on-one	4 years (1 year segments)	Varied: as needed basis	*Delay repeat pregnancies
			Affirmation/emotional support: counseling					*Increase knowledge of parenting and child development
Marshall, Buckner, and Powell [114] 'Teen Parent Program'	$n = 60$	Social learning, social exchange, and social comparison	Informational support: child care and development, parent-child interaction information, demonstrations and feedback	Professionals: family therapist	One-on-one and group	6 months	Weekly contact with a variety of program staff and volunteers	*Improve parenting skills, knowledge of child development (not significantly)

Table 1. continued

Study	Sample Size	Theoretical Foundation	Type of Support Intervention	Source of Support/ Support Agent	Mode	Duration	Frequency of Intervention	Reported Outcomes
			Affirmation support: family counseling	Peer volunteers: community members, young parents club				
Quint [111] 'Project Redirection'	n = 805	Social learning, social exchange, and social comparison	Informational Support: Workshops on parenting skills, employability, and life management	Professionals: social workers	One-on-one and Group	2.5 years	Weekly mentor visits	*Improve employment, welfare, child outcomes
			Emotional/ affirmation support: individual counseling and mentoring	Mentors: women from the community			Workshop attendance varied	*Participants more likely to be employed than comparison group *Participants showed increased parenting skills
Schinke, Barth, Gilchrist, and Maxwell [106]	*n* = 79	Social learning	Informational support: coping skill development (e.g., conflict resolution with informal network members)	Professionals: social workers	Group	12 sessions	Not stated	*Intervention group had more social support at both post-test and 3 months later. *Gains were noted in parenting ability, child care self-efficacy, and psychological well-being
			Affirmation support: feedback and praise					
Experimental intervention studies								
Koniak-Griffin, Verzemnieks, and Cahill [116] 'Adolescents' Mothering Behaviors'	*n* = 31	Social learning and social comparison	Informational support: videotape instruction	Professional: nurses	One-on-one	2 months	2 videotaped sessions with feedback	*Intervention group had significantly higher maternal behavior scores
			Affirmation support: feedback					

Table 1. continued

Study	Sample Size	Theoretical Foundation	Type of Support Intervention	Source of Support/ Support Agent	Mode	Duration	Frequency of Intervention	Reported Outcomes
O'Sullivan and Jacobsen [109] 'Adolescent Health Care Program'	$n = 243$	Social learning and social comparison	Informational support: school plans, family planning, general health information Role modeling	Professionals: pediatrician nurse practitioner social worker	One-on-one	18 months	Scheduled visits approx. every 2 months	*Prevent repeat pregnancies, finish school. *Slightly higher immunization rate in intervention group
Reichman and McLanahan [120], Kisker, Rangarajan and Boller [125] 'Teenage Parent Demonstration'	$n = 5400$	Social learning	Informational support: educational and employment-related activities Instrumental support: child care and transportation	Professionals	Group	4 years	Varied	*Decreased future reliance on welfare, increased school attendance, employment, and child care use *No meaningful effects 6 years later
Reichman and McLanahan [120], Quint, Bos and Polit [119] 'New Chance'	$n = 2000$	Social learning	Informational support: life-skills, parenting classes	Not stated	Group	5 years	Weekly parenting and life-skills classes	*No favorable impacts on attainment of parenting skills or knowledge of child development. *Increased maternal stress

1982 to February 2003 with the search terms: "adolescent parent(s)," "early parenthood," "social support," "child development," "intervention," and "randomized controlled trial." Research literature was gathered based on these database searches. Subsequent articles were retrieved from the reference lists of selected publications. Articles focusing on the population of adolescent parents and their children in the postpartum period and on the physical and psychosocial health consequences of adolescent parenthood were retained. Owing to the different developmental needs and stresses on adolescents compared with older mothers, articles that included adolescent parents as part of a larger risk group were systematically excluded. The descriptive portion of this article provides the context for the exhaustive review of support-education interventions (For reviews that do not emphasize support-education interventions, see [16–19]). Extensive efforts were made to retrieve all articles that described evaluations of support-education intervention programs for adolescent parents or conducted trials of these programs. Table 1 reflects this comprehensive review of support-education interventions.

Conceptual Foundation

Social support is defined as interactions with family members, friends, peers, and health professionals that communicate information, esteem, aid, and understanding [20]. Social support may comprise multiple types (e.g., affirmation, informational, emotional, and instrumental), sources (e.g., professionals, peers, family, partner), modes (e.g., one-on-one, group), frequencies (e.g., weekly or daily contacts), and durations (e.g., weeks or months) [21]. For example, assistance with childcare (instrumental), caring interactions (emotional), shared learning/facts about parenting skills (information), and positive reinforcement (affirmation/esteem) can all facilitate adaptation to parenting. Social support improves coping, moderates the impact of stressors, and promotes health [20–23].

The concept of social support has theoretical links to coping theory [24], social learning theory [25,26], and social exchange theory; theories that have relevance for new parenthood. Lazarus and Folkman describe coping as an individual's cognitive and behavioral efforts used to manage taxing external and/or internal demands appraised as exceeding personal resources [24]. Social support is a coping resource that may be called upon to foster resiliency and coping with the transition to the demands of new motherhood [20]. Social learning theory posits that individuals' perception of their own capabilities affects their behavior, thinking, and emotional reactions in stressful situations like new parenthood [20]. Role modeling, a common means of skill transference in families and a component of many support intervention programs for new parents, is an integral part of social learning theory. Social exchange theory interprets the reciprocal quality of interactions [20]. The notion of reciprocity applies more to lay support relationships, such as parent-to-parent support, than to professional-to-parent support relationships. While there is a normal give-and-take in lay relationships, professionals do not expect to receive anything in return for their support efforts. Adolescent mothers are often single parents and thus have more limited opportunities for reciprocally supportive relationships than mothers with partners. Meeting a parent's need for reciprocal interaction may prepare the parent for the demands of interacting optimally with a child [27,28].

In summary, the availability and use of social support may serve as protection from the potential deleterious effects of adolescent parenting. A supportive person may act as a buffer, lessening the psychological or economic impact of negative events upon the family; be a source of socioemotional support (for the mother); and act as an indirect source of support for the child [21,29].

Support Needs of Adolescent Parents and Their Children

The review of the research revealed that adolescent mothers and their children frequently suffer from psychological, social, and economic difficulties [30–34]. Adolescent mothers are less likely than older mothers to complete high school, attend college, find stable employment, marry, or be self-supporting [16,35–38]. The problems faced by adolescent mothers and their children include poverty, residential instability, living in crime-ridden and violent communities, and less social support than older mothers [29,35,39–41]. These social conditions may precede or stem from early parenthood [38,42,43].

Adolescent mothers exhibit more identity diffusion, coping difficulties, less autonomy, more difficulties with trust, and lower self-esteem than nonparenting adolescents [33], all factors that may interfere with parenting ability. Further, adolescent parents typically experience a 'dual developmental crisis' [44] in

which the developmental tasks of adolescence conflict with the tasks of early parenthood [45]. This developmental crisis results in limited emotional availability of adolescent parents to their infants [46,47]. Compared with older mothers, adolescent mothers are more likely to be depressed [48–50], and less likely to initiate verbal interaction, respond to their children [5,29,33,40,51], and show positive affect [52].

Even when socioeconomic status is controlled, adolescent mothers lack knowledge of developmental milestones and child development [29,39]. Compared with older mothers, they are more punitive in their discipline strategies [40], less nurturing [53], perceive their child's temperament as more difficult [54–56], and pose greater risk for abuse of their children [57].

Children of adolescents have a higher incidence of cognitive and social-emotional developmental difficulties than children born to older or more educated mothers [17,58]. Frequently, adolescents' children live in single-parent, impoverished environments, which may lead to higher rates of childhood behavioral and mental health problems [59,60]. Learning challenges [35], poor school performance, behavioral problems [61,62], and troubled peer relationships [52] are more common among children of adolescent parents than children in the general population [38]. Children of adolescents who achieve developmental success are more likely than their less successful peers to have had more stimulating home environments, mothers with more education, mothers with co-habitating male partners, fewer siblings, and to have lived in more desirable neighborhoods [9]. Social support, whether provided by professionals, family members, partners, or peers, may help ameliorate the potential negative impacts of adolescent parenting on the adolescents themselves and on their children's development [38,63].

Support Resources

Although most adolescent parents receive support (e.g., parenting advice) from professionals and/or informal network members, most indicate that they have additional needs for support resources [64]. The following review of descriptive and correlational studies focuses on the relationships among support resources, adolescent parenthood, and children's development. The data reveal that typical sources of support for adolescents are primarily informal support network members (such as families, partners, and friends) and to a lesser extent, professionals.

Family Support

In comparison to older mothers who often turn to friends for help and information about child care, adolescents more often rely on their mothers and other family members [65]. Family support has been associated with adolescent mothers' overall satisfaction with life and financial matters [66]. Living apart from related adults was the strongest risk factor associated with child maltreatment in Flanagan et al's study of adolescent mothers [57].

A number of studies indicated that the adolescent's mother (child's grandmother) is an important source of social support [67,68]. Burke and Liston [67] found that adolescent mothers rated their own mothers most highly of all support network members. Osofsky et al [33] reported that perceived support from a grandmother enhanced the interactive relationship between adolescent mothers and their infants. As well, help with childcare from grandmothers and extended family was a potent predictor of contingent parent-infant interactions for adolescent mothers [52]. A recent study of 121 adolescent mothers and their 3-year-old children further supports this finding by revealing that intellectual and linguistic delays in children were predicted by maternal IQ and social support from the extended family (e.g., grandmothers) [69].

Conversely, however, Delatte et al found that the mother-grandmother relationship can be stressful for school-age parents [70]. Adolescent mothers must act out the dual role of mother/child, may exhibit feelings of resentment toward the grandmother, and may not experience positive parent-newborn bonding. Co-residence with the grandmother has been linked to increased mother-grandmother conflict, diminished sense of independence and self-confidence in parenting, and poorer child functioning [71]. In one study, both mothers and grandmothers displayed less supportive, more authoritarian, and more negative parenting attitudes when they lived together [72].

Support from family members appears to reduce stress among adolescent mothers, foster the development of optimal parent-infant relationships, and promote infant development. Although adolescent mothers may rate support from their own mothers as their most desirable form of support, helpful support from mothers may not always be forthcoming.

Partner Support

After mothers, adolescent mothers rated their child's father as the second most valuable source of social

support [67]. Living in a nuclear family (adolescent mother and her husband/boyfriend) has been associated with stronger social support and more positive child-rearing attitudes and mother-infant play interactions [73]. Partner support has also been associated with greater responsiveness to infants and greater maternal satisfaction with life [66]. Social support from the infant's father enhances adjustment to parenting and the quality of adolescent mother-infant interaction [74–76]. In contrast, only one identified study suggested that a negative association may exist between adolescent mothers' perceptions of greater social support from partners and optimal maternal behaviors [77]. This unusual finding may have been owing to the reduced time mothers with partners spent with their infants compared to their lone counterparts.

Little support from a partner after birth was associated with anger and punitive behavior by adolescent mothers toward their toddlers [78]. Roye and Balk [79] revealed that partner support was correlated with the mother's psychosocial well-being and favorable developmental outcomes for the infant. The relationship between enhanced child development outcomes and partner support may be explained, in part, by the increased likelihood of adolescent mothers with partners to seek preventive health care for their children and to remain involved in support programs [80,81]. Unfortunately, the relationship between the adolescent mother and the father of the child is often short-lived.

Perceptions of Support Sources

The adolescent parent's perception of reliability and permanence in their relationship with network members was perceived to be essential to successful adaptation to parenthood [82]. Perceived social support has been related to adolescent mother-child interaction quality [83] and confidence in providing infant care [77,84]. Whereas adolescent mothers in one study perceived significantly less social support than older mothers, their perceptions of family support and quality of interactions within the social network were more often associated positively with maternal behavior, life satisfaction, and parental satisfaction [85]. This finding suggests that adolescent mothers may be more responsive to the effects of social support than older mothers, or that their satisfaction with support may be a better predictor of maternal competence than perception of support [77].

Multiple Sources of Support

In a study by Turner et al, a combination of family, partner, and friend support was related to a decreased incidence of depression among adolescent mothers [59]. Although adolescent mothers counted most on grandmothers and partners for support, professional support as provided by pediatricians and nurses was also valued [67]. In another study, primary sources of support for adolescent mothers were their families, and few relied on local social services [86]. Utimately, Dormire et al found that a broad range of social support covering (a) sources of support (e.g., professionals, family, partners, and friends); (b) support functions (e.g., affect, affirmation, aid, information); (c) social network properties (e.g., number in network, duration of relationships, frequency of contact), was significantly related to the quality of adolescent parent-infant interaction [27].

Children's socioemotional problems were predicted best by mothers' internalized problems, such as depression, and lack of social support from partner and friends [69]. An increased network size, including multiple sources of support (e.g., professional, family, friends, partner) and social ties, was significantly associated with diminished maternal stress [87]. Social ties to significant others are linkages through which child-rearing information can flow to affect adolescents' parenting behavior [88]. This is further supported by Ruchala and James, who found that 20% of the variance in maternal confidence scores was explained by adolescent knowledge of infant development and the number of people in their households [84].

While multiple support sources appear to increase knowledge of child development, improve parent-infant interaction, reduce depression and stress, and improve maternal confidence, the quality of relationships with network members may be important. Optimal adaptation to parenting may be fostered by supporting the relationships between adolescent mothers and their own mothers or partners. As well, because knowledge of infant development may be imparted by professionals or "natural" network members (e.g., family, partners, friends), professionals and peers could also play important roles in adolescents' confidence in mothering.

Support-Education Interventions

There is agreement that adolescent parents and their children need social support and education [45,89–91]. As described above, adolescent parents and their

children tend to benefit from family support, partner support, and multiple sources of support, including professionally based social support. As well, adolescent mothers' perceptions of the quality of their support sources play a role in determining the effectiveness of available support on outcomes. In North America, many intervention programs that combine social support from professionals with parenting education were created to foster the development of adolescents and their children [92]. These programs for adolescent mothers generally have resulted in improvements in knowledge of parenting behavior and child development [93]. Published descriptions of interventions directed at adolescent mothers focus on parent-infant interaction [89,94,95], supportive child care [96], and comprehensive services with multiple components (e.g., stress management, parenting skills development, fostering self sufficiency, promoting supportive interactions) [97–104]. Few of the intervention programs reported in the literature have been evaluated. Even fewer have been tested through quasi-experimental or experimental designs. Moreover, the majority of these studies included professionally driven interventions and did not involve support from family, friends or peers.

All post-hoc, quasi-experimental, and experimental studies identified in the literature were reviewed. These studies were designed to increase social support, contraceptive knowledge and behavior, employability, parental confidence and psychological well-being, parenting skills and knowledge, and/or child health and development.

Table 1 provides details for each study reviewed. All interventions were classified as either *post-hoc evaluations of existing programs, quasi-experimental intervention studies, or experimental (RCT) intervention studies.* Characteristics of these studies were captured under the following subheadings: "sample size," "theoretical foundations," "type of intervention (processes)," "intervention source or agent," "intervention mode/delivery," "duration," "frequency," and "outcomes." The Cochrane Collaboration's criteria, where 'A' indicates "low risk of bias," 'B' indicates "moderate risk of bias," and 'C' indicates "high risk of bias" based on assessments of random selection, random assignment, and ability to challenge competing hypotheses ([105], p. 39) correspond to the three categories assigned to studies in this review.

A total of five post-hoc evaluations of existing programs, 10 quasi-experimental intervention studies, and four experimental (RCT) intervention studies were identified. As per the Cochrane Collaboration's criteria the *post-hoc evaluations* are ranked 'C', high risk of bias, *quasi-experimental studies* are ranked 'B', moderate risk of bias, and the *experimental intervention studies* are ranked 'A', low risk of bias. Further information related to these studies is detailed in the following section and in Table 1.

Social Support

Only one study specifically identified changes in the quality and quantity of social support accessible to the adolescent parent as a result of a professional support-education intervention [106]. When compared with control participants, intervention participants in a support group program designed to enhance coping skills reported increased social support immediately after treatment and again 3 months later. The researchers also reported that intervention participants were more likely to access child-care services at 3 months, but not immediately after intervention.

Contraceptive Knowledge and Behavior

A pretest/posttest evaluation of a professional support-education program revealed that the treatment group made significant gains in contraceptive knowledge and behavior [107]. In another study, post-test results revealed positive changes in attitudes toward sexual intercourse amongst the "completer" group who attended most peer-mentored support-education sessions [108]. Another professional support-education program was associated with a decrease in the rate of repeat pregnancies (12% experimental versus 28% control) [109]. Support-education aimed at enhancing contraceptive knowledge and behavior appears to be beneficial for participants who remain involved.

Employability

Professional support-education interventions have been linked to reduced high school drop-out rates among adolescent mothers [110]. Other studies have revealed increased employability associated with support by professionals and peer mentors [111], improved attitudes toward vocational and educational goals from support-education from peers [108], and gains in school graduation rates from support by professionals [70]. Self-efficacy theory grounded a successful combination of a professional and peer-mentored intervention promoting high school completion through daycare provision, child

development classes, personal counseling, and job training [98]. Although support-education interventions aimed at improving employability appear helpful, participants with higher initial education or skills generally benefit more from such programs [112].

Parental Confidence and Psychological Well-being

Significant gains were made in self-confidence and self-esteem after enrollment in a professional support program designed to improve parent-child interactions among adolescent mothers and children [113]. Significant increases were found for the group receiving a support-education intervention on a self-esteem measure [114]. Another intervention resulted in significant differences between intervention and control adolescent mothers on measures of coping, loneliness, and parenting confidence at the 3-month follow-up, but not immediately after the professional and peer-mentored intervention [106]. These results suggest inconsistency in the demonstrated relationships between support-education interventions and parenting confidence and psychological well-being over time, and between treatment and control participants. Further, it is unknown if gains in parenting confidence and psychological well-being translate into parenting skills and knowledge.

Parenting Skills and Knowledge

Teenage mothers who participate in parent training interventions from professionals and peer mentors tend to engage in more face-to-face interactions with their infants, express more realistic childrearing attitudes, and exhibit better knowledge of child development. Gains in empathy, positive reinforcement of child behavior [115], parenting skills, behavioral skills [111], and responsiveness [113], have been observed as a result of support-education interventions. Other studies revealed that the quality of parent-child interaction could be affected by support-education interventions, as interaction scores were consistently higher in the professional support intervention groups compared with the control groups at two follow-up time points [116,117]. Another trial of a peer support intervention found increased empathy scores, decreased inappropriate expectations, and positive changes in emotional tone [108].

Adolescents who participated in professional support-education interventions also experienced significant gains in knowledge of child development [70,93,107], appropriate parenting techniques [107], and reductions in risk for child abuse [93]. Increases in parenting skills and knowledge (e.g., child developmental changes, stimulating child activities) [118] and provision of stimulating home environments [119,120] were also observed in response to mainly professional support-education interventions. However, Reichmann and McLanahan found that only mothers who were not depressed were able to provide stimulating home environments; for mothers who were depressed, intervention provoked increases in maternal stress levels [120].

Child Health and Development

Professional support-education interventions have been associated with increased rates of childhood immunization compared with national averages [121] and to a control group [109]. Another professional support-intervention program reduced the number of days that infants spent in hospital in their first few weeks after birth [122,123]. Enhanced cognitive ability and reduced behavioral difficulties in children have been observed after professional and peer mentored support-education intervention programs [111,117].

Limitations of Support-Education Intervention Studies and Directions for Future Research

The findings of the review of support-education intervention studies revealed several limitations that impact the utility of study findings and provide direction for future research. A review of these limitations is not intended to reduce the value of the knowledge provided by the findings just presented, but rather to guide future research on support-education interventions for adolescent mothers. However, these limitations reduce the clarity of the explanatory theories underlying some social support intervention studies, namely coping theory, social learning, and social exchange. Whenever results are inconclusive or challenged by bias, the underlying theory is inadequately tested. Frequently encountered problems that challenge both the theoretical and practical utility of study findings included small sample sizes and attrition, lack of suitable comparison groups, and measurement inconsistencies. Future research can address these limitations. Researchers should consider the content (e.g., information, affirmation), duration (e.g., 6 months), intensity (e.g.,

weekly sessions), mode (e.g., face-to-face, telephone), level (e.g., group, one-on-one), intervention agents (e.g., peers, professionals), and target of planned support-education interventions.

Attrition and Sample Size

In many studies of support-education interventions for adolescent parents, attrition [70,81,109,110,114,115,118] and small sample sizes [81,113,114,116,124] were major challenges. In some studies, significance testing was foregone, likely owing to the small sample sizes [115,118]. Researchers have also found an exceptionally high dropout rate among control group participants [70,81,109], suggesting that they may need a comparable program that does not confound the measured outcomes. In addition, honoraria and/or reimbursement for time, travel, and expenses of participation (e.g., day care, bus fare) should be provided to maximize the ability of adolescents in both groups to complete the study requirements [120,125]. Further, estimated sample sizes must account for high dropout rates from 50% to 82% in some studies, through additional baseline recruitment [81,109,114].

Control/Suitable Comparison Group

The results of many reviewed studies are challenged either by the complete lack of a comparison/control condition or by an inability to randomly assign participants to intervention and control conditions [106,108,115,118,121,124]. The control group in Marshall et al's study had questionable comparability to the support-education intervention group owing to the nonrandom recruitment methods and preexisting differences in support-seeking behaviors within the convenience sample [114]. Quint's comparison group was selected from a sample of adolescents who met the eligibility criteria, however, nearly two-thirds were enrolled in school compared with fewer than half of the experimental adolescents [111]. Koniak-Griffin et al's findings are limited by the unequal ethnic/racial distributions between the intervention and control group [116]. Caucasian mothers typically score higher on parent-infant interactions [126]. Differential dropout rates between intervention and control groups may be due in part to differences in the make-up of these groups [70]. Further, pretesting was omitted and researchers could not establish the comparability of support-education intervention and control groups [117,120,125].

Marsh and Wirick [107] addressed the ethical question of withholding the intervention from vulnerable subjects to have a valid control group by using an institutional cohort quasi-experimental design to collect control group information before delivering the support-education intervention. The cohorts of participants enrolled in the control condition were followed over time, then offered the intervention and followed again over time. When the first cohort is offered the intervention, a second cohort is offered the control program and so on, until several cohorts are active in the study simultaneously [107]. Thus, intervention participants can be compared with themselves and a control group. Although time intensive, this innovative strategy holds promise for future research.

Measurement

Many studies were challenged by unreliable measurement or inadequate assessment tools [115,118,121]. Measurement was inadequately described and infrequently conducted [106]. Lack of pretesting was problematic in that differences between groups could not be attributed to the support-education intervention [117,120,125]. Additional delayed posttests or an increased time interval between the post and delayed posttests could assess maintenance of effects of support interventions over time [113].

Content and Duration

Inconsistent dosage, duration, and content of parenting support-education intervention groups made comparison difficult. Longer-running support-education interventions appear to be most beneficial [120,125,127]. In one study, significant intervention effects were found only after adolescent mothers had been in the program for at least 10 weeks, with the largest effects observed after mothers were enrolled for the full 20 weeks [124]. In some studies, the content of the program and the exact nature of the information presented to mothers were unclear, thus limiting replicability of the support-education intervention [93,106,108]. Researchers need to document both the processes of social support and progress of the intervention.

The support-education intervention program should have clearly specified goals that are related and achievable. The primary goal may be to promote employability and decrease repeat pregnancies *or* to increase parent-child interactions and child development. In contrast, O'Sullivan and Jacobsen suggested that a comprehensive support program is one way to bring about better outcomes for both adolescent

mothers and their infants [109]. The researcher must consider whether a comprehensive versus targeted intervention program is more likely to be successful. It appears that support-education interventions should begin before or soon after birth, provide demonstrations with real infants, have frequent home visits with hands-on parental education (e.g., visits occurring 2 to 3 times per month), use video therapy and support group discussions [70], and continue for at least one year [70,113,116,117,120,122–124,127]. In any case, it is essential that the support-education intervention program and processes are documented to facilitate replicability of successful programs in research and practice. Further, documentation of intervention ingredients will improve understanding of the support needs unique to adolescents.

Targeting Vulnerable Groups

Age, mental health, and whether or not participation is voluntary may have an impact on the specific target groups for intervention. Participation in support-education intervention programs should be voluntary, as forced participation has been linked to negative effects on the quality of the home environment [120,125]. Mothers at risk for depression may need unique forms of intervention because they may not respond well to support-education interventions and may ultimately provide less stimulating environments than their nondepressed peers [119,120]. Further, adolescent mothers under 16 years of age may not respond as well to intervention, as they are less responsive to their infants than older adolescent mothers [124]. Thorough assessment of the study sample should be completed before intervention to tailor support to participants' support needs, developmental stage, coping strategies, and stressful situations, and to control for confounds such as age and maternal mental health in the analysis of outcomes.

Support Sources and Support Intervention Agents

Although threats to the health and development of children of adolescents may be buffered by a supportive family environment and a stable, supportive partner [11], support-education interventions are rarely provided by nonprofessionals or lay persons. This oversight represents both a practical and theoretical limitation in reported research. Without studies that examine the impact of nonprofessional support from families, partners, and friends, social exchange and social learning theory are inadequately tested and refined.

Family, partners, and friends are the most relied-upon sources of support for adolescent parents, and stable partners may be particularly important. Incorporating partners more directly into interventions may help to reduce attrition; a relationship between instability of the mother-partner relationship and attrition has been reported [81]. Future intervention research should examine ways to maintain supportive relationships with partners, grandmothers, friends, and peers, and to include these informal network members in support-education interventions. In keeping with this recommendation, Crockenberg found that 90% of adolescent mothers preferred to have their informal network members participate with them in the receipt of professional support-education interventions [64].

Health professionals were the sole intervention agents in numerous studies over the past two decades [107,109,113,116,122,123]. Professionals provided accurate information while maintaining the link to formal health services. Most of the interventions emphasize education and informational support more than other forms of support. In contrast to relationships with professionals, lay relationships imply reciprocity. The reciprocal nature of support may be particularly valuable to adolescents because of the influence of peers during this stage. Only one report of a support-education intervention used peers, but the process of delivery of peer support was not clearly described or evaluated [98]. This area is ripe for research with adolescent parents. Recent research with other vulnerable populations has emphasized peer helpers in support programs to capitalize on the reciprocal quality of support interactions [21,128–130]. Another difference between support provided by professionals and by peers is the complementary yet unique contribution of experiential versus professional knowledge [21].

In Quint's study, turnover of lay supporters threatened the reciprocal nature of the interaction between teens and lay support workers [111]. Researchers need to be realistic in the demands placed on lay supporters and provide training, reinforcement, and support that capitalize on the strengths of peers. Professional and peer intervention agents require quality training and monitoring to reduce turnover that threatens study design and program impact.

Support Mode

In selecting the level and mode of support interventions (i.e., group, one-on-one, mixed), researchers

need to consider the implications for the adolescent parents' comfort. Although support groups may increase the likelihood of an adolescent parent developing a reciprocal support relationship with a peer, groups may also hamper an adolescent with low self-esteem from speaking out and participating actively. It may be more feasible to arrange one-on-one support than to arrange regular attendance of adolescent parents at scheduled group meetings with concurrent childcare and transportation demands.

Concluding Comments

Limitations in study design present practical and theoretical challenges that are difficult to surmount. Nonetheless, adolescent parents clearly need support to overcome problems in maternal mental health, quality interactions with their children, their children's health and development, and their future lives. Correlational data revealed that typical sources of support for adolescents are families, partners, and friends, and to a lesser extent, professionals. No research was identified that examined interventions designed to enhance the natural (e.g., family, partner) or peer support networks of adolescents. Further research is needed to test the delivery of both professional and lay support interventions for adolescents. Innovative support interventions that promote reciprocity, social comparison, and social learning in lay or peer relationships need to be investigated. Interventions that foster a healthy mother-father relationship are also important. Adequate comparison groups, appropriate and acceptable intervention agents, relevant outcomes, reliable and valid measurement, assessment of sample characteristics, documentation of support intervention processes, content, and sample sizes that account for attrition are paramount to successful tests of interventions. Although preliminary data from support-education intervention studies suggest optimal intervention duration and intervention agents, more research is needed to clearly delineate the characteristics and impact of successful support interventions for adolescent parents [126, 131].

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