


Reproductive Life Planning in Adolescents

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Abstract

Unplanned pregnancy in adolescents contributes to the burden of disease, mortality, and health and educational disparities experienced by young people during this vulnerable period between childhood and adulthood. Reproductive life planning (RLP) is an approach that has been endorsed and adopted internationally, which prompts individuals and couples to set personal goals regarding if and when to have children based on their own personal priorities. This review discusses RLP tools, their acceptability, effectiveness, and issues in implementation across different contexts, with a specific focus on how RLP has been applied for adolescents. While a range of RLP tools are available and considered acceptable in adult populations, there is minimal evidence of their potential benefits for adolescent populations. Online platforms and information technology are likely to promote reach and implementation of RLP interventions in adolescents. Consideration of the socioecological contexts where adolescent pregnancies are more common should be integral to much needed future work that explores RLP interventions in adolescents.

Keywords

- ▶ adolescents
- ▶ reproductive life planning
- ▶ pregnancy
- ▶ sexual and reproductive health

Despite a decrease in adolescent birth rates over the past 20 years, adolescent pregnancy remains a significant public health issue internationally.^{1,2} Adolescence is the period of transition between childhood to adulthood and how this is recognized varies between cultures.^{3,4} If age is used to define adolescence, the United Nations apply the period between 10 to 19 years.⁴ In low- and middle-income countries (LMICs), an estimated 21 million adolescent girls become pregnant each year and approximately 50% of these pregnancies are unplanned.¹ In high-income countries (HICs), adolescent birth rates are four times lower than LMICs,² but rates are higher in adolescents living in rural and remote areas of HICs and in those who experience socioeconomic disadvantage.^{5–7} While pregnant adolescents in many HICs may find it easier to access abortion,

pregnancy rates in many countries such as the United States are also declining due to several factors such as increased contraception use and access to emergency contraception.^{8,9}

Some adolescent pregnancies are desired and planned, but in most circumstances they occur in underserved communities experiencing poverty and a lack of educational and employment opportunities.^{10,11} In many societies, the cultural and religious milieu supports marriage and childbearing at a young age.^{11–13} Sexual violence and coercion contribute to unintended pregnancies and many adolescents face challenges to their reproductive autonomy due to gender norms in some cultures and societies.¹² Other factors contributing to unplanned adolescent pregnancy include a lack of knowledge and access to sexual and reproductive

Table 1 Reproductive life planning questions¹⁹

Question	If response is “Yes”	If response is “No”
Do you plan to have any (more) children?	How many children do you hope to have? How long do you plan to wait until you (next) become pregnant? How much space do you plan to have between your future pregnancies? What do you plan to do to avoid pregnancy (until you are ready to become pregnant)? What can I do today to help you achieve your plan?	What are you planning to do to prevent becoming pregnant (again)? What can I do today to help you achieve your plan?

health information and services including affordable and stigma-free contraception and abortion.^{1,13}

Around half of adolescent pregnancies end in abortion,^{1,14} often where there is no access to safe services.¹ Adolescent pregnancies face higher risk of maternal and neonatal complications including preeclampsia, infection, preterm delivery, and low birth weight.^{12,15,16} Complications of adolescent pregnancies in girls aged 15 to 19 years is a leading cause of mortality for this age group.¹⁵ Aside from the health concerns, there can be a range of social and economic consequences for pregnant adolescents. Unmarried pregnant adolescents may face stigma, rejection, or violence by partners, parents, and peers and pregnancy often results in leaving school, compromising future educational and employment opportunities.^{7,16}

Addressing unplanned adolescent pregnancy requires public policy that reduces socioeconomic disparity, encompasses educational and life opportunities, health promotion, improved health literacy, and universal access to sexual and reproductive health services. Health services should be youth friendly and include contraception, abortion, and reproductive life planning (RLP).^{13,17} The Centers for Disease Control and Prevention (CDC) defines RLP as a set of personal goals regarding if and when to have children based on an individual's or couple's priorities.¹⁸ This type of planning offers the potential to both reduce unplanned pregnancies and improve sexual and reproductive health and pregnancy outcomes in people of all ages.¹⁸ This review will discuss RLP tools, their acceptability, effectiveness, and issues in implementation across different contexts, with a specific focus on how RLP has been applied for adolescents.

Discussion

Reproductive Life Planning

The concept of RLP was developed in the early 2000s^{19,20} and was promoted by the CDC in 2006 as part of their recommendations to improve preconception health,¹⁸ and is suggested to be included in the Well Woman check by the American College of Obstetricians and Gynecologists.²¹ RLP can be used to encourage men and women of any age, with the support of their health care practitioners, to reflect on their intentions for pregnancy and childbearing within the context of their personal, family, social, and cultural values

and goals and is appropriate to their level of health literacy.^{19,22,23} A proposed set of questions to support individuals with RLP can be seen in ►Table 1.¹⁹

A discussion based on RLP questions could result in the use of contraception and preconception advice and care, depending on the individual's needs. For many people, and particularly for adolescents, the concept of planning their reproductive life may seem abstract, or too far off to be of immediate concern. However, early discussion of future child-bearing desires gives the individual the opportunity to think about their preferences, to realize that they have choices, and to understand the benefits to themselves and their children of planning pregnancy, and, over time, this may develop into a goal or plan.

Other RLP tools that have been developed include the One Key Question (OKQ) approach²⁴ and the Pregnancy, Attitudes, Timing and How important is pregnancy prevention (PATH) tool.^{25,26} The OKQ approach²⁴ aims to support primary health workers to routinely ask reproductive-age women, “Would you like to become pregnant in the next year?” There are four response options: “yes,” “no,” “unsure,” and “okay either way.” Depending on their response, women are then offered preventive health services relevant to their needs that may include identifying and addressing preconception risk or contraceptive counseling. The PATH tool^{25,26} promotes patient-centered, open-ended questions including, “Do you think you might like to have (more) children at some point?” Again, depending on the woman's response (yes, not sure, no), they will be directed to appropriate reproductive health options. Other pregnancy screening tools which ask women, in different ways, about their current pregnancy intentions have also been developed: the Family Planning Quotient,²⁷ the Desire to Avoid Pregnancy (DAP) Scale,²⁸ and the Attitude Toward Potential Pregnancy Scale.²⁹ These screen for current pregnancy intentions and can be used to initiate discussions around relevant reproductive health but do not include a comprehensive work plan supporting further response-based counseling like RLP,¹⁹ the OKQ approach,²⁴ and the PATH tool^{25,26} (►Table 2).

A novel digital online conversational agent “Gabby”^{30,31} undertakes RLP by starting with a preconception health risk assessment that includes current pregnancy plans. From the risk assessment, Gabby creates a personalized, individual

Table 2 Reproductive life planning tools

Tool, country	Aim	Method of implementation
One Key Question, the United States ²⁴	Build standardized screening into standard women's health care	<ul style="list-style-type: none"> • Fortright conversation between patient and provider • Clinical support for all women regardless of social status
Pregnancy Attitudes, Timing and How important is pregnancy prevention (PATH), the United States ^{25,26}	Associate pregnancy timing and selection of contraceptive methods	<ul style="list-style-type: none"> • Contraceptive counseling based on evidence-based practices • Assesses women's emotions • Online version, My Path, has been tested in women veterans³²
Family Planning Quotient (FPQ) and Reproductive Life Index, the United States ²⁷	Facilitate the discussion of family planning and reproductive life goals between patients and providers	<ul style="list-style-type: none"> • Direct communication between patient and provider about goals • Education about contraception
The Desire to Avoid Pregnancy Scale, USA ²⁸	Identify women who could benefit from contraceptive care	<ul style="list-style-type: none"> • Use of psychometric tools that support women to avoid unintended pregnancy
Attitude Toward Potential Pregnancy Scale, the United States ²⁹	Examine associations between contraceptive effectiveness, pregnancy attitude, attitude toward motherhood, intimate partner relationship characteristics, and social dynamics	<ul style="list-style-type: none"> • Assess multiple emotions, allowing for wanting and not wanting a pregnancy
Online conversational agent "Gabby," the United States ^{30,31}	Support women with lifestyle behavior changes to optimize preconception health	<ul style="list-style-type: none"> • An online conversational agent, "Gabby" supports women to complete a comprehensive risk assessment and address identified risks
TeenSource, the United States ³³	Provide "teen-friendly" sexual and reproductive health information	<ul style="list-style-type: none"> • An online resource with a range of information regarding RLP • Adolescents can "hook up" with RLP service providers
My Life My Plan, Canada ^{34,35}	Support adolescents with planning several aspects of their lives, including RLP	<ul style="list-style-type: none"> • A downloadable booklet that adolescents can fill in as they plan several aspects of their lives including RLP
READY-Girls, the United States ³⁶	Increase preconception awareness and advice-seeking behaviors in adolescent girls with type 1 diabetes	<ul style="list-style-type: none"> • Two CD-ROMS, a booklet, and nurse counseling sessions

Abbreviation: RLP, reproductive life planning.

plan called a "My Health To-Do List" that directs counseling toward addressing preconception risks or contraception. Depending on the woman's responses, Gabby works with them over time to meet her reproductive and general health goals. Building on the PATH tool,^{25,26} the online MyPath reproductive goals assessment³² was designed to be used prior to primary care visits. Tested in women Veterans in the United States, MyPath also included information about reproductive health and contraception. This online tool was found to be acceptable to both women and healthcare providers and increased women's uptake of primary care visits to address their reproductive health needs.

There has also been some targeting of RLP toward adolescents. For example, TeenSource³³ is a U.S.-based, not-for-profit, online resource that encourages adolescents to consider RLP and provides them with information about sexually transmitted infections, contraception, and relationships. The Best Start Resource Centre,³⁴ funded by the Government of Ontario, developed the My Life My Plan³⁵ resource that supports adolescents to plan several aspects of their lives,

including the plans around reproduction. To the authors' knowledge, these resources have not been evaluated. READY-Girls is a RLP counseling program for adolescents with type 1 diabetes.³⁶ This mostly self-directed program was evaluated as having a positive impact on preconception advice-seeking behaviors³⁶ (► **Table 2**).

A recent systematic review of RLP interventions conducted by Hipp et al³⁷ in 2019 identified 12 studies that met their inclusion criteria. Interestingly, all included studies were conducted in HICs, ten in the United States and two in Sweden. Most were targeted to women but none were targeted to adolescents, specifically. In this systematic review,³⁷ the authors observed three outcomes by which RLP interventions have been evaluated using a range of study designs. These outcomes were (1) health providers and participants' perceptions and acceptability of RLP, (2) change in participants' knowledge, and (3) change in participants' behaviors. While the overall findings synthesized by Hipp et al³⁷ were derived from studies that included mostly adult participants, they provide a hint, or starting point, for

discussing the potential acceptability and efficacy of RLP interventions in adolescents.

Acceptability for Women and Health Providers

RLP is generally considered to be acceptable by women and health providers across a range of health care and geographical settings.³⁷ Several factors have been explored, including the ways in which information was communicated, specific elements of RLP that participants found most valuable, the settings in which the interventions were delivered, and the societal and individual factors that affected how participants perceived RLP.

In terms of communication and specific elements of RLP, women have reported that they value the straightforward and organized formatting of RLP interventions, opportunities for self-reflection,³⁸ and being prompted to ask questions and discuss specific topics of interest with their health providers.^{38,39} Callegari et al⁴⁰ and Kransdorf et al⁴¹ found that women desired provider-initiated and nonjudgmental counseling that incorporated their preferences, desires, and values.

In relation to settings in which RLP interventions were delivered and societal and individual factors that affected how participants perceived RLP, Bello et al³⁸ qualitatively synthesized women's and providers' perceptions of a novel reproductive health self-assessment tool in a primary care clinic that served low-income African American women in Chicago, IL. Providers thought that the RLP self-assessment tool prompted women, who would otherwise not bring up the topic, to initiate conversations about their sexual and reproductive health. Women reported that the RLP self-assessment tool gave them an opportunity to reflect on their pregnancy plans and gain new knowledge about the importance of their health before pregnancy. Patient-provider conversations challenged provider's assumptions about women's pregnancy plans and changed the way they provided education and support. Overall, both women and providers found the RLP tool had the potential to improve reproductive health counseling and that it was acceptable to implement in primary care.³⁸ Dunlop et al³⁹ also explored the acceptability of integrating RLP into primary care, again in a clinic that served women who experienced disadvantage, but this time in Atlanta, GA. In this study, both men and women were recruited. Interestingly, 82% of women reported that RLP was important to their encounter, compared with only 42% of males. All female (19.4%) and male (8.3%) participants who wanted to have a child in the next year considered RLP to be important, while only 65% of women and 30% of men who reported never wanting a child considered it to be important. Considering that approximately 83% of women and 89% of men experience parenthood at some stage,⁴² this finding highlights an important challenge when planning public health messages around the relevance of RLP for all people, regardless of pregnancy intentions.

Henderson et al⁴³ examined provider perceptions of RLP in postpartum care. Outcomes measured in this study were providers' evaluation of the feasibility, acceptability, and level of comfort with the use of RLP to initiate discussions of birth spacing and contraception needs with women during the postpartum period. Providers reported that overall, RLP

was easy and acceptable to implement in this clinical setting and that women appeared comfortable in discussing their contraceptive needs.

Other individual studies have also shown that RLP is feasible in both HIC and LMICs.^{44,45} While the aforementioned studies indicate that RLP interventions are acceptable and feasible to health providers and patients, more research is required to explore potential benefits in adolescent populations, specifically.

There is emerging evidence of the acceptability of RLP interventions in adolescents. The online conversational agent "Gabby" was tested in African American women aged 15 to 22 years and was found to be acceptable in this population group.³⁰ "Gabby" was also further tested in women in Australia. While the study recruited women aged 18 years or older, one of the key findings was that this tool could be targeted to those at school because of ease of access and use of information technology.^{46,47} On the other hand, midwives in contraceptive counseling clinics in Sweden reported RLP was a useful and acceptable health promotion tool that facilitated broader health conversations with women⁴⁸ but had mixed views about the appropriateness of using RLP with adolescents. The reasons for this were not explained.

Does RLP Lead to Increased Knowledge of Sexual and Reproductive Health and Family Planning?

There is some, albeit limited, evidence that RLP interventions have a positive impact on individuals' knowledge of reproductive health. However, the quality of this evidence is low due to the nature of the study designs, self-reporting, and small samples sizes.³⁷ In HICs, RLP interventions have been shown to increase women's knowledge. For example, women living with obesity, diabetes, and/or hypertension who participated in a RLP intervention in the United States reported an improved understanding of the risk of pregnancy associated with their condition.⁴⁹ This increased knowledge led to increased feelings of self-efficacy in initiating positive health behaviors related to their sexual and reproductive health. However, whether this increased knowledge and self-efficacy led to behavior change was not assessed.

There is limited assessment of RLP interventions in LMICs. One study of a modified RLP intervention delivered to adult women in Eswatini, South Africa, by community workers called Mentor Mothers reported increased knowledge and confidence to facilitate RLP conversations with women in the Mentor Mothers.⁴⁵ Whether more knowledgeable and confident Mentor Mothers increased women's knowledge or changed health behaviors was not explored, but there was reported increased contraception uptake.

Overall, the variation in study settings, target population demographics, and assessment tools make it difficult to make generalizable conclusions regarding the impact of RLP on individuals' knowledge.

The evidence around whether RLP interventions increase adolescents' knowledge of sexual and reproductive health and family planning is even less conclusive. The READY-Girls³⁶ RLP intervention involved self-directed learning and nurse consultations for girls with type 1 diabetes (►Table 2). This

intervention improved participants' knowledge but did not increase contraceptive use. This may have been because most of the participants were aged 17 years or younger and many of them were not yet sexually active. The READY-Girls intervention was specifically targeted to adolescent girls with type 1 diabetes and not a general adolescent population. Adolescence is a time of rapid growth and development and young people at this stage of life have specific learning needs. Schools may offer an alternate opportunity for more adolescents to access to RLP support. Unfortunately, the delivery of sexual and reproductive health education in schools in both HICs and LMICs has been labeled inconsistent and inadequate, with teachers acknowledging that they need additional training and support in this area.⁵⁰

Does RLP Lead to Behavior Change that Optimizes Sexual and Reproductive Health and Family Planning?

While reproductive health knowledge has been shown to improve with RLP interventions, the question of whether RLP interventions lead to behavior change remains unanswered.³⁷ Perhaps the most compelling evidence that RLP interventions may improve lifestyle behaviors associated with sexual and reproductive health is found with the online conversational agent Gabby (► **Table 2**). This intervention was tested in a randomized controlled trial (RCT) of 528 African American women aged 18 to 34 years across the United States.^{31,51} After completing the comprehensive risk assessment that generated a tailored "My Health To-Do List," participants in the intervention group worked through their list of identified risks over 1 year. Women in the intervention group reported reaching the action or maintenance stage of change for significantly more risks than the control group. While this intervention was not solely based on RLP, the questions in the risk assessment prompted participants to consider family planning and their behaviors that impact on sexual and reproductive health. The online nature of Gabby may appeal to even younger audiences and, therefore, support adolescents to access evidence-based information and support regarding RLP.

Challenges in Implementing RLP Interventions in Adolescents and Future Directions

RLP interventions benefit individuals and communities; however, empirical evidence in adolescents, specifically, is absolutely lacking. The majority of reported RLP interventions, to date, are across urban and rural settings in HICs and have included adult women from culturally and linguistically diverse backgrounds.³⁷ Further research in adolescents with a particular focus on those who are most at risk is required.

Rapid repeat pregnancy, defined as a pregnancy within 2 years of a previous pregnancy, occurs among nearly 35% of recently pregnant adolescents⁵² and in the first 12 months of the postpartum period, there is higher susceptibility to unintended conceptions.⁵³ Among adolescents, a range of strategies have been trialed to reduce the risk of repeated unintended pregnancy. Such strategies include psychosocial interventions conducted via home visits, community interventions or over the telephone,⁵⁴ cash payments, educational strategies,⁵⁵ and the provision of long-acting reversible

but highly reliable contraception immediately following an abortion or birth.^{56,57} The degree to which RLP, either within the health system or other community settings including schools, may be of assistance to teenage mothers is unknown. Considering that these adolescents may be a little more engaged with the health system or social services, at least in the few months postpartum, and the increased risk of a rapid repeat pregnancy, this population should be considered a priority.

The Mentor Mothers modified RLP intervention⁴⁵ commented on social, cultural, and financial barriers to women having autonomy in family planning. These included partners using conception as a form of control over one another, stigma, taboos around RLP discussions outside of families, and men being disengaged with RLP conversations and decisions. Undertaking programs that work mainly with the individual and not the broader socioecological context of family, economic support, and access to health care will limit the ability for women to enact behavior change even with increased knowledge and awareness. Additional service and financial supports may support behavior change as will broader improvement in sexual and reproductive health literacy.

Cultural, social, economic, and geographic barriers to behavior change and optimizing sexual and reproductive health in adolescents are important considerations in the development of RLP interventions. An example of where these factors were considered is CyberRwanda,⁵⁸ an intervention that will give adolescents private access to sexual and reproductive health information and streamlined access to contraception and other essential products through an online ordering platform. The first phase of this intervention involved human-centered design where young people and other key stakeholders developed the intervention aimed at individuals aged 12 to 19 years. CyberRwanda supports young people to answer medically relevant questions, read information about contraception, and place online orders before discreet person collection at participating pharmacies. The second phase of this research, a cluster RCT to evaluate the implementation of CyberRwanda, is underway. The CyberRwanda intervention demonstrates the importance of co-designed, pragmatic, and multifaceted interventions to address the complexities involved in RLP in adolescents.⁵⁸

Globally, young people are increasingly using digital platforms for health information. Therefore, innovative online RLP interventions are likely to be a key component of reaching adolescents with RLP interventions. The online conversational agent Gabby has already been tested in African American Women in the United States,^{30,31} where it has been proven to promote behavior change, was tested and found to be acceptable to women living in Australia,^{46,47} and is currently being tested in women living in Lesotho. Women appreciated the rapport they were able to build with Gabby as well as woman-centered and culturally tailored advice that was easily accessible to them online.⁴⁶ Compared with face-to-face medical checkups, online risk assessments and health education can break down barriers to identifying sensitive health issues, including those around sexual and reproductive health.

Future Directions

This overview of RLP interventions highlights not just gaps, but chasms, in RLP interventions for adolescents. Further research is required to determine the efficacy of RLP interventions for adolescents in different settings, including the short-term and long-term outcomes. How best to frame the purpose of RLP to adolescents, how to deliver RLPs with nonjudgmental and person-centered support, who should be involved, and the barriers and enablers of RLP in this group should be clearly described. Identifying how best to reach and engage adolescents is vital and RLP interventions based on digital platforms will likely be one of the key ways to reach adolescent populations with youth-driven design important to ensure any tools are engaging, educational, and impactful.

Conclusion

A range of RLP tools are available for use in settings where adolescents access education, health care, and social support. Health professionals and individuals report RLP to be acceptable and feasible across a range of settings; however, the majority of these opinions were expressed by health professionals and adult women living in HICs. There is emerging evidence of how RLP can positively impact on the knowledge and behaviors of adults and adolescents, at least in the short term, but little evidence to date of an impact on contraception use and improved pregnancy planning. Certainly, more work is required to address socioecological contexts that challenge behavior change, particularly in adolescents who may be more vulnerable to repeated unplanned pregnancies. Making use of emerging online platforms and information technology is likely to promote reach and implementation of RLP interventions in adolescents.

Conflict of Interest

The authors report no conflict of interest.

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