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Social predictors of repeat adolescent pregnancy and focused strategies

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Abstract

This chapter starts with an overview of teenage pregnancy within a social context. Data are then presented on conceptions and repeat conceptions in teenagers. Social predictors of repeat teenage pregnancy are grouped according to social ecological theory. A brief summary of prevention of teenage pregnancy in general is followed by a detailed analysis of studies of interventions designed to prevent repeat pregnancy that reached specific quality criteria. The results of some systematic reviews show no significant overall effect on repeat pregnancy, whereas others show an overall significant reduction. Youth development programmes are shown in some cases to lower pregnancy rates but in other cases to have no effect or even to increase them. Features of secondary prevention programmes more likely to be successful are highlighted.

Key words

repeat, adolescent, teenage, pregnancy, predictor, strategy, prevention, intervention

Definitions

Adolescents are defined by the World Health Organization (WHO) as young people aged from 10 to 19 years¹, i.e it includes three years before entry into the teen years. Conceptions at ages under 14 are rare. It should be noted that 18 and 19 year olds have reached the age of majority and are no longer children; they may hold a commercial pilot's licence, be appointed as a police officer or become a Member of Parliament². The terms adolescents and teenagers will be used interchangeably in this article.

Much of the literature on repeat pregnancy in adolescence refers to the term rapid repeat pregnancy, which is defined as a subsequent pregnancy within 12 - 24 months of a previous pregnancy. This term is used with respect to adolescents who give birth, rather than those who have abortions. This review focuses mainly on conceptions leading to births.

Introduction

Most teenage women are biologically mature and often look like adults long before they reach mental maturity. This creates the dilemma of how much their reproductive behaviour should be determined by their autonomy and how much adult guardians and professionals should attempt to modify it.

Societal attitudes towards teenage pregnancy and motherhood are negative in many countries³. However, these negative attitudes are not necessarily shared by all ethnic groups living in that country, in particular by those in society living in poverty⁴, the exact social group that are being targeted by public health interventions. This gives rise to the possibility that attempts to change reproductive behaviour could be interpreted as coercive.

National policy concern about teenage pregnancy varies from no concern to major concern; this is not necessarily related to high or low teenage fertility⁵. Countries such as France and Spain with low rates express major concern. Countries such as Iceland and the Slovak Republic with rates nearly as high as the UK express no concern.

As many as 15 million adolescent girls give birth and 4 million have abortions each year¹. Worldwide, most adolescent pregnancies are in countries with a high rate of child marriage¹. In some cultures and ethnic groups, early childbearing is the social norm. Consideration needs to be given as to whether early marriage and childbearing violate an individual's reproductive rights⁶. Children (age under 18) have the right to privacy⁷. Adults have the right to marry and found a family⁸. Professionals have a duty to protect children from exploitation. These conflicting factors must be taken together so that the overall best interests of the child are promoted, taking into account the individual teenager's competence and circumstances.

It should not be forgotten that a proportion of teenage childbearing takes place in some countries because of restrictive abortion laws⁹. In countries in which teenagers have a free choice, as many as 81% of conceptions end in abortion (see section on Conceptions).

Antecedents to adolescent pregnancy have a strong socio-economic flavour. In the United States, with the highest rate of teenage births among industrialized nations, 40 million people live in poverty¹⁰. In the United Kingdom, with the highest rate of teenage births in Western Europe, 13 million people live in households on a low income¹¹. Teenage pregnancy is strongly associated with social disadvantage. Social disadvantage includes unemployment, poverty and discrimination. But clearly this is not the whole story, as there are many less affluent countries in the Western world that do not have such high teenage fertility.

Young women who have grown up unhappy, in poor material circumstances, who do not enjoy school and are despondent about their future may be more likely to take risks when having sex or to choose to have a baby¹². Teenage mothers are often socially isolated¹³. Adolescence is often described in the psychological literature as a time of 'crisis'; motherhood at the same time can create an even greater crisis¹⁴. Some teenage mothers may feel they have limited educational and occupational options and so they do not see early motherhood as problematic. Some teenagers have a positive desire to become pregnant¹⁵. More than a third of teenager mothers intend to become pregnant, either for the first time¹⁶ or when having subsequent rapid repeat pregnancies¹⁷. Other teenagers experience ambivalence about becoming pregnant^{15;18}. Unintended pregnancies may be viewed as a form of escapism, representing temporary hopes in the minds of teenagers for positive change in their lives¹⁹.

An adolescent who has had one unintended pregnancy is vulnerable to subsequent unwanted pregnancies. Studies in Latin America showed that younger adolescent mothers have a shorter birth interval and more subsequent births than older adolescent mothers²⁰. Early childbearing tends to perpetuate a cycle of poverty. Teenage mothers who manage an inter-pregnancy interval of two years tend to avoid many of the negative consequences of early childbearing that often lead to chronic poverty and welfare dependence²¹.

Background

Conceptions

Data on conceptions have become increasingly available. These data include births and legal abortions only; miscarriages are known to be the outcome of around 12% of conceptions^{22,23}. Conception rates of European adolescents range from 12.4 per 1000 women aged 15 – 19 in Italy through to 64.7 per 1000 in the Russian Federation²⁴. The UK is in the five European countries with the highest conception rates, after the Russian Federation, Bulgaria, Romania and Tajikistan. The European country with the highest proportion of adolescent conceptions ending in abortion is Sweden: in 2007 there were 7584 abortions²⁵ and 1810 births²⁶ to women aged 19 and under, giving an abortion ratio per 100 known pregnancies of 81. The other extreme is Malta where the abortion ratio is zero as abortions are not done even when a pregnant woman's life is at risk. In England & Wales the abortion ratio per 100 known pregnancies for adolescents is 50 (Table 1). In the USA the abortion ratio for adolescents is 33²⁷. The abortion ratio in particular geographical areas is known to be related to deprivation²⁸.

Conception rates rise with increasing age through adolescence. Table 2 shows a breakdown of the conception rate for each teenage year for England & Wales. In the under 20s, 96% of conceptions are outside marriage. Table 1 shows the even distribution of viable pregnancies between births and induced abortions among the under 20s. In England & Wales, 50% of women under the age of 18 who conceive decide to have an induced abortion, compared to 22% for all ages²⁹; the figure ranges from 66% in 14 year olds to 36% in 19 year olds. In Sweden, 95% of 15 year

olds who become pregnant decide to have an abortion; the figure for 19 year olds is 69%²⁵.

Teenage conceptions in Britain are strongly associated with social disadvantage^{30;31}. In addition, individual and spatial characteristics are important in influencing levels of teenage conception, including in urban areas the distance a young woman lives from the nearest youth oriented family planning clinic³². While social deprivation indices are useful measures, the explanation of higher teenage pregnancy rates in deprived areas is probably multifactorial and includes personal factors such as low self-esteem, lower educational and occupational aspirations, less knowledge of contraception and sexual health services and higher gender power differentials³³.

The proportion of births that take place to women aged under 20 is 1.7% in Sweden²⁶, 6.5% in England and Wales³⁴ and 10.4% in the USA³⁵. The reason why the United States shows so much concern about teenage pregnancy is possibly due in part to sheer numbers: there were 441,832 births to women under the age of 20 in 2006.

Repeat conceptions

Data on repeat conceptions to teenagers are rarer. In England & Wales, 8% of women under the age of 18 undergoing abortion have had a previous abortion (Table 3); this compares with the figure of 33% repeat abortions for women of all ages³⁶. Further analysis of English and Welsh data shows that in women aged under 20 years undergoing an abortion in 2007, 13% had had a previous abortion and 11% a previous birth³⁷. Care needs to be taken when looking at secular trends in repeat abortion rates; there is an inevitable rise after liberalization of abortion laws, with attainment of a steady state after several decades³⁸. In Sweden, abortion statistics give both previous abortions and previous deliveries (Table 4)²⁵; 3% of adolescents undergoing abortion have had previous deliveries and 15% have had previous abortions.

In England & Wales birth statistics give numbers of previous children for married women only³⁴; only 1% of maternities to the under 20s are within marriage²⁹. Hospital Episode Statistics for England do not give a breakdown of deliveries by age, nor any obstetric history. In the USA birth order data exist: for 15 -19 year olds in 2006, the fertility rate was 33.7 per 1000 for those having their first delivery and 7.0

per 1000 for those having their second delivery³⁵. Of US deprived teenagers who give birth, 17 – 35% become pregnant again within 12 months³⁹.

Adverse effects associated with adolescent childbearing

This review does not cover obstetric aspects of teenage pregnancy. Women who begin childbearing in adolescence seemingly face a range of adverse social and economic consequences during pregnancy and later in life⁴⁰⁻⁴². Teenagers who give birth are less likely to complete schooling and so they jeopardize their ability and opportunity to obtain higher paid jobs. Teenage mothers are more likely than older mothers to⁴³:

- be in social housing
- be unemployed, or their partner unemployed
- be on benefits
- experience partnership dissolution by age 30

Teenage mothers are also more likely to remain as single parents throughout their adult life. It tends to be more difficult for them to find and retain a partner and they are more likely to partner with unemployment-prone and lower earning men⁴⁴.

There are negative health outcomes for the children born to adolescents too⁴⁵. These are thought to be mediated through the mother's poor mental state⁴³. Infant mortality is higher, as is childhood mortality through to age seven⁴⁶. There is an increased risk of accidents and poisoning^{43;47}. Children born to teenage mothers have an increased risk of cognitive and behavioural deficits, with the cycle of deprivation continuing with early sexual activity and teenage pregnancy⁴⁸.

Adverse economic, psychosocial, medical and educational outcomes are compounded when repeat adolescent pregnancies occur^{40;49}. Short birth intervals reduce the time devoted to the second child⁴¹.

These associations between teenage pregnancy and adverse outcomes are probably not causal and so there is a big question mark as to whether age-related interventions are the best policy⁵⁰. Interventions aimed at reducing social disadvantage may be more effective.

Rights of pregnant adolescents

In general, laws nowadays are giving children more rights and parents fewer rights⁵¹. Adolescents who have not reached the age of majority can still expect to have their confidentiality respected, their educational needs met and to be able to make their own decisions as to whether or not to continue a pregnancy. Prevention programmes should not be coercive. Laws insisting on parental authorisation of abortion⁹ do not respect these rights.

Social predictors of repeat adolescent pregnancy

It is not uncommon for a second teenage birth to be planned¹⁸. Teenage mothers may consider subsequent childbearing in order to give their first child a sibling or to complete their family before continuing with their education or vocation.

It must be stressed that those adolescents who have repeat births in many ways do not differ from those having a first pregnancy. Some studies show very few differences⁵². Thus, prediction of a rapid second birth has been largely unsuccessful^{40;41}. In this respect, the literature is similar to that of repeat abortion³⁸. It also needs to be borne in mind that most of the studies in the literature are of very deprived American communities and so conclusions may not be generalizable to less deprived communities or to other countries.

This review focuses on social rather than medical or psychiatric factors predicting repeat adolescent pregnancy. A good way to group social predictors of repeat adolescent pregnancy is according to social ecological theory using different levels of influence on behavioural outcomes⁵³: individual, couple, family, peer/community and social system. Extreme caution is needed in relying on studies that have not been replicated.

Individual level

Associations have been found between repeat adolescent pregnancy and:

- aggression⁵⁴
- early age of first pregnancy⁵⁵⁻⁵⁷
- having planned the first pregnancy^{17;55;58}
- having positive attitudes towards childbearing at a young age⁵⁹
- wanting to have a baby^{58;60}

- choice of oral contraception rather than long-acting reversible contraception^{58;61-63}

Couple level

Associations have been found with:

- marriage before^{16;55} or after the index pregnancy⁵⁵
- a partner who is appreciably (three or more years) older^{58;60}
- a partner who wants a child^{17;64}
- intimate partner violence^{58;65}
- breakdown in relationship with father of child⁵⁸

Family level

Associations have been found with:

- poor mother-daughter relationship^{58;64}
- lack of family support^{58;59;66}
- a mother with low educational achievement⁵⁵
- a mother who herself was a teenage mother³⁹

Peer/community level

Associations have been found with:

- a majority of friends have experienced pregnancy⁵⁶
- dropping out of school prior to the index pregnancy^{39;59;67;68}
- not going back to school after delivery^{55;58;60;68}
- low educational aspirations^{57;69}

Social system level

Associations have been found with:

- low socio-economic status^{39;58;68}
- low educational status⁷⁰

It should be noted that two of these factors are identical to ones identified generally as associated with repeat abortion: low socioeconomic status and intimate partner violence³⁸.

Prevention of adolescent pregnancy in general

Traditional approaches such as sex and relationships education and better sexual and reproductive health services are not effective on their own^{71;72}. Pregnancy prevention initiatives for teenagers need to address the following three overarching themes⁷³:

- social disadvantage and dysfunction
- values and norms about sexual behaviour and childbearing; perceptions of these norms by adolescents
- attachment to parents, groups or institutions that emphasize responsible sexual behaviour

Strategies for prevention and health promotion that have been recommended include⁷⁴:

- early childhood interventions aimed at promoting cognitive and social development through pre-school education, parent training and social skills training
- clinical services including contraception and obstetric care
- sex education programmes that provide developmentally appropriate, evidence-based curricula
- youth development strategies to enhance life skills, connections to supportive adults, and educational and economic opportunities

A Cochrane review concluded that limited information suggests that programmes that involve concurrent application of multiple interventions (educational, skill building and contraception provision) can reduce rates of unintended pregnancy in adolescents⁷⁵.

A systematic review showed that both early childhood interventions and youth development programmes can significantly lower teenage pregnancy rates¹².

However, it should be noted that youth development programmes may have no effect on pregnancy rates, or even increase them⁷⁶. The latter effect was the case with the Young People's Development Programme in England⁷⁷. Bringing together teenage

girls at high risk of pregnancy may increase pregnancy rates, possibly as a result of young women being labelled as high risk or by being exposed to peers who reinforce risk-taking behaviour.

Prevention of repeat adolescent pregnancy

By definition, prevention of repeat pregnancy cannot include early childhood interventions, as the woman has already become of reproductive age and is sexually active. This probably makes prevention of repeat pregnancy a more difficult proposition than prevention of a first teenage pregnancy.

Theoretical models

The design of interventions depends on a conceptualization of the underlying reason for repeat births. The problem behaviour model views repeat pregnancy in the context of other deviant behaviours such as substance misuse, delinquency and school problems⁷⁸. An alternative is the social development model which emphasises the importance of formation of social bonds and how they are essential for success in life⁷⁹.

Strategies

Prevention of repeat pregnancy in teenagers is a secondary prevention public health measure. There are many examples of studies in the literature that had no effect on repeat adolescent pregnancy; these will not be described in this review. There are also many studies in the literature that, although showing resultant apparently low pregnancy rates after interventions, have no comparator group. These also will not be considered.

Some prevention programmes are referred to as comprehensive. This term means that the intervention can address the special circumstances of teenage mothers, such as immaturity and involvement in problem behaviours, as well as their socio-economic needs and their reproductive health. Programmes need input from multiple disciplines, including education, nursing, social work, mental health, obstetric and paediatric.

Programmes that have been tried include the following:

- parenting skills
- contraceptive education and supplies

- the relationship with the mother of the adolescent
- enhancement of self-efficacy
- education about the adverse effects of closely spaced pregnancies
- extended duration beyond the immediate postpartum period
- simultaneous care for the adolescent mother and her baby
- continuity of care from professionals
- access to mental health services
- help with child care
- educational and vocational services
- placing the teenage mother within the context of her home, neighbourhood and school
- continuation for a prolonged period e.g. more than one year

High-quality studies

A meta-analysis of the effect of teenage parent programmes on pregnancy rates has been performed⁸⁰. English language publications were selected according to four criteria: a) the study reported on a secondary pregnancy prevention programme, b) the study implemented an intervention, c) the study included pregnancy as an outcome and d) the study reported sample sizes for the experimental and control and/or comparator group and frequency or percentage data on the rate of pregnancy for each group. Out of 60 studies, 16 met the criteria (Table 5). Thirteen studies were published and three unpublished. All studies were from the USA. Mostly low-income African Americans were being targeted. Eleven studies were randomized and five were not. Three studies had higher pregnancy rates in the intervention groups and 13 had reduced pregnancy rates. The overall result was at least a 50% reduction in the odds of pregnancy at first follow up which was at an average of 19 months. By the time of the second follow up, which was at an average of 31 months, there was no discernable reduction. The varied programmes included home visits, school-based interventions, support groups and peer-based incentives. There was no particular type of programme that emerged as the most effective.

A previous systematic review included many of these same studies. Eight interventions aimed at preventing repeat pregnancy were identified; four out of eight resulted in significantly lower rates of repeat pregnancy⁸¹.

Since the publication of the meta-analysis, one further high quality study has been identified. A randomized controlled trial of low-income black American adolescents participating in a home-based mentoring programme focusing on autonomy and parenting showed effectiveness as early as after two visits and the effect increased over time⁸². Having two or more intervention visits increased the odds of not having a second infant more than threefold. There were no second births among mothers who participated in at least eight sessions.

Finally, a high-quality systematic review which included quantitative and qualitative studies showed no significant overall effect on repeat pregnancy⁸³.

Features of successful programmes

One of the fundamental aims of a secondary prevention intervention is to convince a teenage mother that delaying a subsequent birth is advantageous to her baby. The cultivation of maternal support is also key to success. In terms of the process, it appears that individualized, rather than group, counselling is more likely to be successful⁴¹.

Programmes probably more likely to have greater effectiveness in reducing rapid repeat pregnancy include the following components^{63;81;84-86}:

- multi-session nurse home visiting
- a multidisciplinary youth-oriented approach
- contraception teaching
- easy access to services
- targeting young women at antenatal and postnatal consultations in relation to their first pregnancy
- combined mother/infant care
- integrated clinical and social services

Apart from antenatal and postnatal care, it is unconvincing from the research that there is a difference between the general approaches needed and settings used for primary and secondary prevention.

Conclusions

There is no evidence to indicate that prediction of repeat pregnancy differs from prediction of a first pregnancy. The overwhelming impression is the strong association of teenage pregnancy in general with social disadvantage. This makes specific interventions nigh impossible to design, unless they deliver financial aid, rehousing and other social assistance.

Interventions tried to date have met with variable success. There is a strong suggestion that the not inconsiderable methodological challenges with the studies so far make interpretation uncertain.

It would seem doubtful whether it is valid to separate scientific study of primary and secondary prevention of teenage pregnancy. It is abundantly clear that, if it is considered appropriate to intervene in teenagers' lives to prevent pregnancy in a local population, a collaborative approach is needed with other disciplines. Sex and relationships education and promotion of contraception are not effective on their own.

Practice points

Social predictors of repeat adolescent pregnancy include a planned first pregnancy, not using long-acting reversible contraception, lack of family support, a history of dropping out of school prior to the index pregnancy, not returning to school after the index pregnancy and low socio-economic status.

Many programmes designed to prevent repeat adolescent pregnancy have not lowered the pregnancy rate.

Secondary prevention programmes are more likely to be successful if they include individualized counselling, home visits, a multidisciplinary youth-oriented approach, contraception teaching and easy access to services.

Research agenda

- What are the most effective and cost-effective methods, and tools for, identifying individuals at high risk of repeat adolescent conceptions? ⁸⁷
- What are the key characteristics of an effective and cost-effective one to one discussion to reduce repeat adolescent conceptions among those who engage in risky behaviour?⁸⁷

Conflict of interest statement

The author confirms that he has no conflicts of interest to declare.

Table 1 Outcome of conceptions for women aged under 20: residents of England & Wales, 2007²⁹

Outcome	Numbers*
Miscarriages/ectopics	16,000
Births	45,000
Induced abortions	45,000
Total conceptions	106,000

* Approximate only

Table 2 Conception rates by age of woman at conception: residents of England & Wales, 2007²⁹

Age of woman at conception	Rate per 1000 women in age group
Under 14	1.2
14	5.8
15	17.5
16	39.3
17	61.9
18	83.9
19	96.8

Table 3 Numbers (percentage) of abortions to women aged under 18 by previous abortion: residents of England & Wales, 2008³⁶

No. of previous abortions	Number (%)
None	17,849 (92)
1	1,448 (7.5)
2	74 (0.4)
>2	16 (0.1)
Total	19,387 (100)

Table 4 Numbers of abortions to women aged under 20 years by previous deliveries and previous abortions: Sweden, 2007²⁵

Number	Previous deliveries	Previous abortions
0	7262	6368
1	207	969
2	23	129
3	3	18
4	1	2
Missing data	88	98
Total	7584	7584

Table 5 Summary Table of a Meta-analysis of secondary prevention programmes⁸⁰

Authors	Type of programme	Randomised?	Design rating*	Odds ratio (CI)
Badger ⁸⁸	Education	R	5	0.16 (.027-.944)
Belzer et al ⁸⁹	Contraceptive	R	5	0.33 (.097-1.13)
Elster et al ⁹⁰	Comprehensive	N	3	0.39 (.14-1.08)
Field et al ⁹¹	Educational home visits	R	9	0.387 (.09-1.6)
Kelsey et al ⁹²	Home visits	R	7	1.20 (.88-1.64)
Key et al ⁹³	Comprehensive	N	4	0.11 (.03-.36)
Koniak-Griffin et al ⁹⁴	Home visits	R	7	0.54 (.24-1.22)
Nelson et al ⁹⁵	Comprehensive	N	4	0.30 (.10-.89)
O'Sullivan & Jacobsen ⁹⁶	Educational in hospital	R	7	0.35 (.17-.70)
Polit & Kahn ⁹⁷	Comprehensive	N	4	0.76 (.38-1.51)
Quint et al ⁹⁸	Comprehensive	R	6	1.04 (.81-1.35)
Sims & Luster ⁹⁹	Home visits	R	6	0.83 (.37-1.86)
Solomon & Liefeld ⁸⁴	Comprehensive	R	4	0.16 (.04-.64)
Stevens-Simon et al 1997 ¹⁰⁰	Incentive	R	6	1.53 (.33-8.2)
Stevens-Simon et al 1999 ¹⁰¹	Contraceptive	N	3	0.11 (.03-.36)
Wagner et al ¹⁰²	Educational	R	8	0.62 (.32-1.22)
All studies combined				0.47 (.32-.70)

* Study design ratings are from 1 to 9, with 9 being the highest quality study

Word count: 6566 including references and Tables

Multiple choice questions

Question 1

The following statements are true in relation to teenage pregnancy:

- (a) There is a strong association with social disadvantage.
- (b) Planned pregnancies are uncommon
- (c) Conception rates rise with increasing age through adolescence
- (d) The United Kingdom has the highest rate of teenage births among industrialized countries
- (e) Children born to teenage mothers have an increased risk of accidents

Answers to question 1

- (a) T (b) F (c) T (d) F (e) T

Explanation to the answers to question 1

- (a) This effect permeates all the literature.
- (b) On the contrary, more than one third of teenagers intend to become pregnant
- (c) There is an incremental rise in conception rate each year through adolescence. The figure in England & Wales for 2007 rises from 5.8 per 1000 at age 14 to 96.8 per 1000 at age 19.
- (d) The United States has the highest rate of teenage births among industrialized nations.
- (e) This has been shown for instance by a group at the University of Southampton.

2. The following have been shown to be social predictors of repeat adolescent pregnancy:

- (a) A police record
- (b) Substance misuse
- (c) Dropping out of school prior to the index pregnancy
- (d) An unintended first pregnancy
- (e) Choice of oral contraception rather than long-acting reversible contraception

Answers to question 2

- (a) F (b) F (c) T (d) F (e) T

Explanation to the answers to question 2

- (a) There is no evidence for this.
- (b) There is no evidence for this.
- (c) This association has been shown by at least four different studies: Maynard & Rajarajan, Stevens-Simon et al, Polit & Kahn and Manlove et al.
- (d) It is the opposite: having planned the first pregnancy
- (e) This has been shown by at least four different studies: Ranieri & Wiemann, O'Dell et al, Templeman et al and Stevens-Simon et al.

3. The following statements are true in relation to the prevention of repeat adolescent pregnancy:

- (a) Most studies have been carried out in developing countries so that their generalizability to developed countries is questionable
- (b) Individualized as opposed to group counselling tends to be more effective
- (c) Programmes set in schools are usually more effective than home-based approaches
- (d) Most prevention programmes have at least some beneficial effect on pregnancy rates
- (e) Combined mother and infant care has generally been found to be of benefit

Answers to question 3

- (a) F (b) T (c) F (d) F (e) T

Explanation to the answers to question 3

(a) Most studies have been carried out in the USA. These studies are mostly among deprived communities and so conclusions may not be generalizable to less deprived American communities or to other countries

(b) This has been shown by Klerman.

(c) Home visits by nurses have been shown to be effective. One of the main features of teenage pregnancy is lack of enjoyment of school. Absence from school is an important predictor of repeat adolescent pregnancy.

(d) Some programmes are ineffective and some have higher pregnancy rates in the intervention group.

(e) This has been shown in at least five different studies.

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