



TEENAGE PREGNANCY: SOME ASSOCIATED RISK FACTORS- A REVIEW

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ARTICLE INFO

Article History:

Received 12th May, 2020

Received in revised form 23rd

June, 2020

Accepted 7th July, 2020

Published online 28th August, 2020

Key words:

Adolescent pregnancy; Risk-factors; LBW; Neonatal mortality; Current trends.

ABSTRACT

Adolescent pregnancy, which is detrimental to the health of mother and child, is a common public health problem around the world. It is one of the key issues concerning the reproductive health of women not just in developing countries but also in developed countries. There is growing awareness that early childbearing has numerous consequences in terms of maternal health, child health, and overall well-being of the society. Pregnancy among teenagers is considered high risk due to its high incidence of undesirable outcomes like LBW, prematurity, neonatal mortality, maternal mortality, etc. This brief review summarizes the influence of different factors that are believed to be associated with teenage pregnancy and its outcome. The purpose of this article is to review current trends and issues on adolescent pregnancy to update the practitioners. We should take steps not just to improve the reproductive results but also to decrease the incidence of teenage pregnancy by increasing public awareness, ensuring female education, and enforcing marriage law. Teenage pregnancy needs to be tackled as a priority to ease the burden of socioeconomic and health issues.

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INTRODUCTION

Adolescence is a time of the transition from childhood to adulthood. Pregnancy in a girl aged between 10-19 years is adolescent or teenage pregnancy. Teenage pregnancy is a worldwide phenomenon. Globally, teenage pregnancy rates range from 143 per 1000 in some sub-Saharan African countries to 2.9 per 1000 in South Korea. Save the Children found that annually, 13 million children are born to women aged <20 around the world, more than 90% in developing countries. Entanglements of pregnancy and childbirth are the leading causes of mortality among women aged 15-19 in such areas. The highest risk of maternal death in young girls was seen in Africa, Afghanistan, Bangladesh, Guatemala, Haiti, Nepal, Nicaragua, and Yemen. The pregnancy rate among teenagers in the USA was 67.8 pregnancies per 1000 women aged 15-19 in 2008. The teenage birth rate in the United States is highest in the developed world and the teenage abortion rate is high as well. The reported teenage pregnancy rate in South Asian countries like Bangladesh, Nepal, and India is 35%, 21%, and 21% respectively. Most recent data recommends that teenage pregnancy in India is high with 62 pregnant teens out of every 1000 women. The rate of early marriage and pregnancy got lowered sharply in Indonesia and Malaysia.

In the industrialized Asian countries such as South Korea and Singapore, teenage birth rates are among the lowest in the world. A major issue for the pregnant teen relates to her own body, and degree of both physical and emotional development achieved during the pubertal procedure. The incomplete development of the genital tract and the musculoskeletal system of pregnant teens predispose them to worse overall obstetrical results. There are greater rates of spontaneous abortion, preterm delivery, and low birth weight among adolescent girls as compared to older women aged 20-29. Moreover, complications of pregnancy lead to twice as many deaths in adolescents compared to adult women. In addition to the expanded maternal mortality rates, pregnancy can induce psychological stress on adolescents, particularly with undesired pregnancies. The related psychological and emotional burdens are economic responsibilities, the adjustment in lifestyle, and changes in the family dynamic. Because of negative medical and social outcomes, it is pertinent to launch interventions to avoid teenage pregnancies. Recognition of the risk factors that influence the occurrence of teenage pregnancies is the basis on which viable preventive programs should be developed[1]. Numerous investigations have inspected factors related to adolescent pregnancy in low- and middle-income nations. From micro-to macro-level studies, many factors are found to be associated with teenager's health, particularly their pregnancy. This article gives a comprehensive understanding of risk factors and protective variables for teenage pregnancy. This additionally attempted to reveal the complex relationship among factors

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and teenage pregnancy. The results of this review recommend that future research needs to look at interactions among factors and study the mediating or moderating impact among various factors. Policymakers and program officers need to design pregnancy prevention programs by considering individual, school or community, and national level of risk factors for adolescent pregnancy. Furthermore, the specific context and background of adolescents and their health need to be taken into account[2].

Risk Factors for Adolescent Pregnancies

Factors increasing pregnancy among adolescent girls are numerous and may differ between populations. Teenage pregnancy in developed nations usually happens outside marriage, and in numerous communities and cultures carries a social stigma. In other countries and cultures especially in the developing world, teenage pregnancy is often within marriage and does not include social stigma. Living in disorganized neighborhoods and in a family with lower socioeconomic status, low educational attainment, living with a solitary parent, being a victim of sexual abuse, poor parent-child closeness, poor parental guidance, or control of children's activities are variables elevating the risk of teenage pregnancy in the USA. Socioeconomic disadvantage, disrupted family structure, and restricted education, risky sexual behavior such as early sexual initiation, an increasing number of partners, and non-use of contraceptives were the elements associated with teenage pregnancies in European Union Countries. The risk factors distinguished for teenage pregnancy in South Asian nations like Bangladesh, India, and Nepal incorporate a low socio-economic background, low educational attainment, disrupted family structure, and poor sexual health practices[1]. Risk factors related to teenage pregnancy may be extensively classified under three main headings:

1)Nutritional; 2)Physiological and clinical; 3)Socio-economical.

Nutritional Risk-Factors

Pre-pregnancy nutritional status: Pre-pregnancy nutritional status of a mother is greatly determined by nutrition during her growing years. Chronic childhood undernutrition resulting in maternal stunting negatively affects reproductive performance [3]. Low maternal height (<145 cm) is known to increase significantly the incidence of LBW, especially when mothers are undernourished. Researchers have demonstrated that with increasing maternal height and body stature (W/H) birth weight increases [4]. However, there is no unanimity on a minimum height and weight of a mother for a desirable pregnancy outcome. Different critical values for maternal height and weight in different countries have been reported.

Nutrition before/ during pregnancy: Acute undernutrition before or during pregnancy leading to low pre-pregnancy weight and depleted maternal stores is found to result in undesirable pregnancy outcomes [3]. Nutrition during pregnancy as indicated by total weight gain and pattern of weight gain during the entire period of gestation significantly influence the birth weight of the infant. The effect of prenatal weight gain and pre-pregnancy weight status is additive. Thus,

except in extreme cases, the more the weight gain during pregnancy, the larger is the infant [5], [6]. Only in the case of an overweight mother, this relation does not hold. Several studies have indicated that adolescent mothers gain more weight than mature women. Comparatively higher birth-weight of their progeny have been attributed to higher prenatal weight gain [7], [8]. Besides the total weight gain during pregnancy, the pattern of weight gain throughout pregnancy also seems to influence the outcome. Poor weight gain during the first 24 weeks increases the risk of small for gestational age (SGA) infants and if it is inadequate during the third trimester, the risk of preterm delivery increases despite total weight gain being adequate [9]. More understanding of the physiological mechanism underlying the relationship between maternal age, weight gain, and pregnancy outcome is necessary. Few researchers however have recommended prenatal weight gain to be $\geq 40\%$ of standard weight for height for adolescent mothers as against 20% for mature women for the desired outcome of pregnancy [10]. While considering the weight gain norms, the degree of physical work during pregnancy also requires special attention, especially in developing countries. Researchers have demonstrated that prenatal weight gain and subsequent pregnancy outcome improves if women maintain energy balance by reducing physical work to counterbalance low dietary energy intake [11].

Maternal Anaemia: Studies have indicated that maternal anemia is associated with an increased incidence of LBW, prematurity, intrauterine growth retardation, high perinatal mortality, and maternal mortality rate [12]. There are not many studies reported in the literature regarding the specific implications of anaemia among teenage mothers. However, it might be expected to be similar or maybe even more severe than among adult women.

Physiological and Clinical Risk-Factors

Physiological maturity: Physiological maturity of the reproductive organs of a mother is a prerequisite for the desired outcome of pregnancy. Physiological maturity is associated with an event of menarche. Although growth spurt occurs before menarche, linear growth as well as the maturity process of reproductive organs continues for 4-5 years after menarche. Age at menarche is mostly influenced by nutrition during childhood. Early age at menarche (10-11 yr) is associated with smaller body size and weight [5] continued linear growth, lower lean body mass, etc[13]. Early pregnancy in such girls may result in a high incidence of LBW infants because of prematurity or retarded intrauterine growth. It is found to be also associated with other undesirable pregnancy outcomes such as spontaneous abortion, habitual abortions, ectopic pregnancy [14] in young girls. Recent studies have shown that early maturers have different serum hormonal profiles than late maturers which is responsible for fetal growth retardation [15]. Some researchers have reported an association of low gynaecologic age (GA) with poor pregnancy outcomes even in the case of late maturers (16-17 yr). This is believed to be due to less developed uterine vasculature and inadequate placental or uterine blood flow. However, other researchers are not in agreement with these

findings as they could not show a strong relationship between low GA and poor pregnancy outcomes [16].

Growth status: There is rapid linear growth during adolescence resulting in increased nutritional requirements. It is hypothesized that the nutritional demands for maternal growth may compete with fetal growth, leading to compromised growth of both fetus and mother. Some researchers attribute LBW infants of adolescent mothers to be continued maternal growth [17], whereas others believed that there is no maternal stature growth after conception. It is important however to note that there are no accurate and reliable methods of assessing maternal growth potential after conception. Chronological age and gynecological age are poor indices of adolescence growth potential owing to individual variation in the timing of pubertal growth spurt [18]. An increase in knee height indicator of continued growth may be used provided very accurate and the high precision device is available as increases in knee height may be very small. Despite this, few researchers have reported the association of growth status and pregnancy outcome of teenage mothers using different methods of assessing growth potential.

Antenatal care: Adequacy of antenatal care is thought to be significantly associated with pregnancy outcomes of adolescent mothers. This factor may gain more significance in developing countries, where the majority of adolescent mothers are not exposed to prenatal care, either because of ignorance and poverty or because of inadequate/ absence of medical facilities. Medical intervention during delivery is also inadequate in a developing country. A high prevalence of home deliveries is seen even now.

Socio-Economic Factors

Social deprivation: Teenagers from unskilled manual backgrounds (social class V) are multiple times more likely to become teenage mothers than those from professional backgrounds (social class I). Teenagers from socially deprived areas are up to six times more likely to become pregnant than adolescents from different zones and are much less likely to opt for a termination.

Low educational accomplishment: Young individuals scoring below average on measures of educational achievement at ages 7 and 16 years are at essentially increased risk of turning out to be teenage parents, especially those whose performance decreases between these ages. Wellings *et al.* surveyed more than 11,000 males and females aged 16–44 years across the UK. They found that 29% of sexually active young women who left school at 16 years of age with no qualifications had a child before the age of 18 years, compared with 14% of those who left at 16 with qualifications and 1% of individuals who left at age 17 years or over.

Teenage parents: There is proof that women who were themselves children of teenage mothers are more likely to have an adolescent pregnancy compared with those born to older mothers and the offspring are at risk for becoming teenaged mothers or fathers themselves.

Socioeconomic deprivation: The solid relationship between teenage pregnancy and socioeconomic deprivation was highlighted in the report of the 1997–1999 Confidential

Enquiry into Maternal and Child Health. There were 14 deaths of mothers aged <18 years, 5 of whom were <16 years old. Thirteen out of 14 were socially excluded, 50% had unveiled domestic violence (compared with 12% of the whole cohort of mothers who died) and 50% were poor attendees at the antenatal clinic (compared with 20% of the total cohort who were poor attenders or booked late). Furthermore, four of the women were homeless at the time of demise, despite three of them being under 16 years of age and the care of social services at that point. The relationship between deprivation and maternal deaths was additionally found in the subsequent report, 2000–2002. Teenage pregnancy has likewise been related to an increased prevalence of domestic violence. However, a recent review of 15 studies has failed to explain whether there is a causal connection between maltreatment or violence and adolescent pregnancy or whether there is an increased risk of domestic violence to pregnant teenagers [19].

Pregnancy Outcome of Teenage Pregnancy

Many unfavorable outcomes have been related to teenage pregnancy including premature delivery, infants being small for gestational age, low birth weight, and expanded neonatal mortality, anaemia, and pregnancy-induced hypertension. In the long term, the offspring of teenagers have poorer cognitive development, lower educational attainment, more often criminal activity, and a higher risk of abuse, neglect, and behavioral problems during childhood. Despite the magnitude of the problem, it is unknown whether the poor outcomes of teenage pregnancy are somewhat attributable to the biological challenges presented by young maternal age or whether they are solely the consequence of socio-demographic factors. The biological risks may have been exaggerated in previous investigations because of inadequate controls for socio-demographic risk factors. Socio-demographic factors associated with teenage pregnancy undoubtedly increase the danger of unfavorable results. However, recent studies have shown that the relative risk remains significantly elevated for both younger and older teen mothers after adjustment for marital status, level of education, and adequacy of prenatal care.

The high risk of adverse pregnancy result in the adolescent has been attributed to gynecological immaturity and the development & nutritional status of the mother. Gynecological immaturity without a doubt predisposes adolescent girls to poor pregnancy outcome in that the rates of spontaneous miscarriage and very preterm birth (<32 weeks of gestation) are most noteworthy in girls aged 13–15 years. However, maternal development and nutritional status during pregnancy also appear to play a potentially modifiable role. Many teenage girls retain the potential to grow while pregnant. Data from a study from Camden, New Jersey, 16 one of the poorest cities in the USA, have demonstrated that almost 50% of adolescents continue to grow while pregnant. This growth is related to larger pregnancy weight gains, increased fat stores, and greater postpartum weight retention than in non-growing adolescents and mature women. Paradoxically, despite the changes typically related to increased fetal size (larger pregnancy weight gains, increased fat stores), the offspring are smaller in developing than non-growing adolescents. This significant decrease in fetal growth rate is attributed to competition for

nutrients between the maternal body and the gravid uterus. There is a complex interplay between socioeconomic and biological factors that impacts the outcome of teenage pregnancy[19].

A survey on teenage pregnancy reported that 25% of all pregnancies in Sub-Saharan Africa and Asia end in induced abortion. Nutrition is necessary for fetal growth and is directly associated with maternal anthropometry and placental volume. Low maternal weight and body mass index at conception or delivery and poor weight gain during pregnancy have been related to low birth weight, prematurity, and maternal delivery entanglements. Adolescent mothers are at about three times higher risk of having anaemia. Anaemia is of great obstetric concern as the condition is associated with various complications including low birth weight and increased risk of preterm delivery[1]. Low weight gain increases the risk of having a low birth weight child. This is often compounded by adverse social circumstances.

Adolescent pregnancy is at expanded risk for neonatal complications as prematurity, low birth weight, Intrauterine Growth Retardation (IUGR) neonatal mortality, and stillbirth. The maternal entanglements like preeclampsia, perineal tear, and episiotomy are also likewise among adolescents. Preterm labor has been related to various factors including genital tract infection, extragenital chronic inflammation, stress, and lifestyle factors which might be stronger determinants in pregnant adolescents than in adult pregnant women. In teenagers, anatomical characteristics of the cervix (Especially the short cervix) would support preterm delivery.

Immaturity of the pelvic bones and of the birth canal might be an important factor in obstetric risk in young teenagers. Evidence recommends that due to the relative immaturity of their physiological development, adolescents are more likely than older women to experience complications during delivery. Higher occurrence of cesarean section, operative vaginal delivery(both vacuum and forceps extraction), and obstetric fistulas in adolescents, compared with that of older women, recommends an increased hazard of prolonged and obstructed labor in adolescents. Some investigations have shown that the risk of Caesarean section is increased in teenage pregnancy while some have shown the inverse. Furthermore, children born to adolescents are more likely to have poorer long term educational, behavioral and health outcomes as compared to children born to older parents[1].

Smoking compounds the potential for unfavorable results of adolescent pregnancy, especially intrauterine growth restriction. Smoking during pregnancy is also known to be related to an increased risk of placental abruption, preterm premature rupture of membranes, preterm birth, stillbirth, and sudden infant death syndrome. Studies have shown that prenatal exposure to tobacco smoke is a risk factor for respiratory infections, asthma, allergy, childhood cancer, and unfavorable neuro-behavioral development.

There is some proof that teenage mothers are more prone to experience postnatal depression and have difficulties with breastfeeding as compared to older mothers. Furthermore, one study reported a 37–54% decrease in milk production months

after childbirth in teenage mothers compared with older mothers. There were a few differences in breastfeeding behavior between the two groups that may have contributed to the outcome but it appears that teenagers need additional support with breastfeeding[19].

Treatment of Adolescent Pregnancy

Comprehensive prenatal care from the start guarantees a healthier baby. Smoking, alcohol use, and drug abuse ought to be strongly discouraged in pregnant teens. Since pregnant teen girls carry a high risk of pregnancy, she should be cared for in a hospital. Close antenatal check-up, suggestion on adequate nutrition, correction of anaemia, early detection of pre-eclampsia, advice on more rest to avoid premature births, and good antenatal and postnatal care everything is important. There must be adequate provision of access to effective contraceptive information and services for birth spacing, following delivery to discourage adolescents from becoming pregnant again. Satisfactory nutrition must be assured through both education and the availability of community resources[1].

Prevention

There are many different kinds of teenage pregnancy prevention programs. Studies in pregnancy prevention have attempted to address various facets of adolescent sexual activity, contraceptive use, and pregnancy[19]. A lot of health educators have argued that comprehensive sex education would effectively decrease the number of teenage pregnancies. Interventions combining education and contraceptives seem to reduce unplanned teenage pregnancy, although no intervention yet stands out as the most effective. Education could play a critical role in developing self – confidence increasing age at first sexual intercourse and delaying marriage. Compulsory sex education can assure to empower the girls, which is the most effective strategy to set them up for late marriage, planned and delayed pregnancy, and better motherhood.

A successful prevention program will include the following strategies (Modified from American Academy of Pediatrics, Committee on Adolescence)-

- i. Teenagers must be encouraged to postpone early sexual activity. Abstinence counseling and information on and access to pregnancy prevention/termination, if they become sexually active, are important.
- ii. Physicians must be sensitive to issues relating to adolescent sexuality and be prepared to obtain a developmentally appropriate sexual history on all adolescent patients.
- iii. It should be ensured that each & every teenager who is sexually active has knowledge of and access to contraception.
- iv. Physicians should advocate for comprehensive medical and psychological support for all pregnant adolescents. Early and adequate prenatal care should be tailored to the medical, social, nutritional, and educational needs of the adolescents and should include child care training also.
- v. Teenage mothers should not receive early postpartum discharge so that clinicians can ensure that the mother is capable of caring for their child.

- vi. The adolescent mother's partner and father of her child should be included in teenage pregnancy and parenting programs with access to education and vocational training, parenting skills classes, and contraceptive education. We should serve as resources for pregnant teenagers and their infants, the teenager's family, and the father of the baby to ensure that optimal health care is obtained and appropriate support is provided to them[1].

Management

General measures: While there is no proof, until this point of medical interventions that can specifically improve pregnancy results, we must guarantee that teenage mothers receive supportive care and are directed towards the social help they need. Smoking cessation should be targeted and attendance at an antenatal clinic encouraged. Moreover, effective postnatal counseling, particularly regarding contraception, can help prevent subsequent pregnancies and STIs.

Antenatal care: Teenagers must be encouraged to attend for antenatal care from an early stage as attendance is frequently poor. Gestational age should be affirmed with early ultrasound wherever possible, although many teenagers present late. This is an opportunity to offer advice on nutrition and adverse habits such as smoking and alcohol use. Social support is also very important and many teenagers may benefit from early referral to a specialist midwife or social worker. Information regarding antenatal care and labor must be provided in a format that is accessible and easily understood. Caregivers should be sensitive to the potential challenges presented by written information, as a significant number of teenagers have literacy troubles.

Care during labor and delivery: Where age is the just a risk factor, management is usually the same as for other laboring women. However, in very young teenagers there is an increased likelihood of obstructed labor because of a small, immature pelvis.

Postnatal management: The postnatal period allows counseling and education from the obstetrician, midwife, general practitioner, health visitor, and social worker as well. Teenage mothers are more prone to have unhealthy habits that make the infant at greater risk of inadequate growth, infection, and chemical dependence. Less than the age of 20 years, the younger the mother, the greater the risk of her infant dying during the first year of life. Infant feeding, growth, and safety must be observed. Having her first child during adolescence makes a woman more likely to have more children overall. Women in this group are also less likely to receive child support from the biological fathers: over 50% of children of adolescent mothers don't live with their biological father. They are less likely to finish their education and establish the independence and financial security that enable them to provide for themselves and their children without outside assistance. There are, thus, some areas that need special attention, particularly discussion regarding financial issues, returning to school, and contraceptive counsel[19].

Previous Reviews

A retrospective review was done on the obstetric result of teenage pregnancies delivered in 1 year in a centre of Department of Obstetrics and Gynaecology, The University of Hong Kong, and the Department of Obstetrics and Gynaecology, Tsan Yuk Hospital, Hong Kong. The results were compared with the rest of the obstetric population in the same hospital in the same year. The teenage mothers (n 5 194) had expanded incidence of sexually transmitted diseases (5.2 versus 1.0%, P, 0.05), and preterm labor (13.0 versus 7.0%, P, 0.01), but the decreased incidence of gestational glucose intolerance (3.1 versus 11.4%, P, 0.001), as compared to the non-teenage mothers (n 5 4914). There was no difference in the types of labor, while the incidence of Caesarean section was lower (4.1 versus 12.6%, P, 0.001) in the adolescent mothers. Although the incidence of low birth weight was higher in the teenage mothers (13.5 versus 6.5%, P, 0.001), there was no particular difference in the mean birth-weight, gestation at delivery, the incidence of total preterm delivery, or perinatal mortality or morbidity. The results show that the major risk associated with teenage pregnancies is preterm labor, but the perinatal outcome is favorable[20].

A retrospective comparative hospital-based cohort study of all singleton pregnancies and deliveries that performed in a teenage group (<20 years old) compared with a young adult group (aged 20–24 years old) at "CuzaVoda" Hospital, Iasi, Romania, which is the reference center for the region of northeastern Romania. Result showed that teenage pregnancy is a risk factor for preterm birth <37 weeks (1.21 [1.08–1.35]), foetal growth restriction (1.34 [1.21–1.48]), episiotomy (1.27 [1.21–1.34]), uterine revision (1.15 [1.06–1.25]), APGAR <7 at 1 min (2.42 [1.21–1.67]), cephalopelvic disproportion (1.26 [1.07–1.48]), and postpartum haemorrhage (1.42 [1.25–1.62]); however, caesarean delivery occurs less frequently in teenagers than in adults (0.75 [0.70–0.80]). The following comorbidities are risk factors for teenage pregnancy (risk ratio [CI 95%]): anaemia (1.13 [1.10–1.17]), low urinary tract infection (1.10 [1.03–1.18]), pediculosis (2.42 [1.90–3.00]), anogenitalcondyloma (1.50 [1.04–2.17]), and trichomoniasis (1.74 [1.12–2.68]). The risks for hepatitis B and hepatitis C, premature rupture of membranes, and placenta praevia were lower compared with those in the young adult group, respectively, 0.43 (0.26–0.71), 0.90 (0.85–0.96), and 0.29 (0.20–0.41), while the risk for gestational diabetes and preeclampsia were the same in both groups[21].

A retrospective cohort study of 3886364 nulliparous pregnant women <25 years of age with a live singleton birth during 1995 and 2000 in the United States was carried out. All teenage groups were associated with increased risks for preterm delivery, low birth weight, and neonatal mortality. Infants born to teenage mothers aged 17 or younger had a higher risk for the low Apgar score at 5 min. Further adjustment for weight gain during pregnancy did not change the observed association. Restricting the analysis to white married mothers with age-appropriate education level, adequate prenatal care, without smoking and alcohol use during pregnancy yielded similar results[22].

A. D. Raj *et al.* searched MEDLINE, EMBASE, and CINAHL database (1996 to April 2007) and web-based information. Inclusion criteria were the English-language papers available

in the UK and describing teenage pregnancy in South Asia. Out of the seven countries in South Asia, most of the studies were related to Nepal, Bangladesh, India, and Sri Lanka. Socio-economic factors, low educational attainment, cultural and family structure were all consistently identified as risk factors for teenage pregnancy. The majority of teenage girls are reported with basic knowledge on sexual health however, very few of them have used the knowledge into practice. Both the social and medical consequences of teenage pregnancies are reported consistently throughout most of the studies. The utilization of health services, which is a protective factor, remains low and consistent. However, teenagers agreed to delay the indexed pregnancy if they would know its consequences[23].

Data for this study was derived from the recent three consecutive (2006, 2011, and 2016) Nepal Demographic and Health Surveys (NDHS). A total of 7,788 adolescent women aged 15±19 years were included in the analysis. Trends and multivariable logistic regression analysis was performed to examine the factors associated with adolescent pregnancy. Over the study period (2006±2016), the rate of adolescent pregnancy was 173 [95% Confidence Interval (CI): 159, 188] per 1000 women aged 15±19 years. Adolescent pregnancy was significantly higher among women with middle household wealth index [adjusted Odds Ratio (AOR) 2.19, 95% confidence interval CI 1.65, 2.91], or poor household wealth index (aOR 2.37, 95% CI 1.76, 3.21). Similarly, Dalit (aOR 1.87, 95% CI 1.50, 2.34) or Madhesi (aOR 1.67, 95% CI 1.32, 2.11); and unemployed (aOR 1.28, 95% CI 1.09, 1.50) women had higher odds of adolescent pregnancies. In contrast, adolescent pregnancy was significantly lower among educated women (aOR 0.60, 95% CI 0.48, 0.74), and women with access to media exposure to public health issues (aOR 0.75, 95% CI 0.64, 0.88)[24].

This was a community based comparative study conducted in three districts of Colombo, Anuradhapura, and Batticaloa in Sri Lanka. For each of the 510 pregnant teenagers, 508 age-matched non-pregnant females were identified from the neighborhood. Information related to an individual level, family level, and societal level risk factors were collected by trained interviewers using a structured pre-tested. Risk factors were assessed in univariate and multivariate analyses. Tamil (OR=3.31) and Muslim (OR=1.92) ethnicity were predictors of teenage pregnancy. The lower level of formal education (OR=1.95) and lack of knowledge on disadvantages of teenage pregnancies (OR=3.79), less support from the teachers (OR=3.47), and lack of strictness in the family (OR=2.01) have also contributed to teenage pregnancy. Teenagers with higher confidence in decision making (OR=2.11) were also at risk of becoming pregnant[25].

This study used linkable administrative databases housed at the Manitoba Centre for Health Policy (MCHP). The original cohort consisted of 17,115 women born in Manitoba between April 1, 1979, and March 31, 1994, who stayed in the province until at least their 20th birthday, had at least one older sister and had no missing values on key variables. Propensity score matching (1:2) was used to create balanced cohorts for two conditional logistic regression models; one examining the

impact of an older sister's teenage pregnancy and the other analyzing the effect of the mother's teenage childbearing. The adjusted odds of becoming pregnant between ages 14 and 19 for teens with at least one older sister having a teenage pregnancy were 3.38 (99 % CI 2.77–4.13) times higher than for women whose older sister(s) did not have a teenage pregnancy. Teenage daughters of mothers who had their first child before age 20 had 1.57 (99 % CI 1.30–1.89) times higher odds of pregnancy than those whose mothers had their first child after age 19. Educational achievement was adjusted for in a sub-population examining the odds of pregnancy between ages 16 and 19. After this adjustment, the odds of teenage pregnancy for teens with at least one older sister who had a teenage pregnancy were reduced to 2.48 (99 % CI 2.01–3.06) and the odds of pregnancy for teen daughters of teenage mothers were reduced to 1.39 (99 % CI 1.15–1.68)[26].

In India, Nguyen and colleagues analyzed data on 60096 primiparous women aged 15–49 years who gave birth between 2010–16 from the fourth National Family Health Survey (NFHS-4) 2015–16. They examined whether first pregnancy in adolescence (10–19 years of age) was associated with higher child undernutrition compared with first pregnancy after adolescence, and if so, whether biological, social, and programmatic factors explain this intergenerational risk. The five hypothesized mechanisms—maternal nutritional status, education and bargaining power, access to health services, child feeding practices, and living conditions—were examined using structural equation modeling. The study provides evidence that teenage pregnancy was associated with higher undernutrition risks and that children born to teenage mothers were 0.25 SD shorter for their age and 5 percentage points more likely to be stunted compared with those born to adult mothers. As many as 25% of adolescents in the survey gave birth, and teenage mothers were more vulnerable and disenfranchised compared with older first-time mothers—they married younger, were poorer, undernourished themselves, reported lower agency, and were excluded from health services. In India, 26.8% of girls (17.5% in urban and 31.5% in rural areas) were married before 18 years of age in 2015–16, and the states of Bihar (42.5%), West Bengal (41.6%), Jharkhand (37.9%), and Uttar Pradesh (21.1%) reported a high prevalence of child marriage. Early marriage of girls infringes on their social and health rights and, as gender researchers have shown, often leads to school dropout, fewer livelihood options, lower bargaining power within households concerning their autonomy or say in family planning, social isolation, and domestic violence. Married adolescent girls are also less likely to use contraceptives, and poor birth spacing increases risks for low birthweight among offspring, with long term effects on morbidity and mortality. Adolescence is a crucial life stage, marking the transition from childhood to adulthood. The adolescent health programs in India (eg, Rashtriya Kishor Swasthya Karyakram) have brought adolescent issues into the mainstream to some extent. Developmental and programmatic factors related to adolescent health, as also outlined in the study (mechanistic factors account for an 11 percentage point increase in the prevalence of child stunting), need more scrutiny from a gender equity perspective. This study should prompt a moment of reflection because it renews focus on

understanding the inequalities faced by women and girls at home, school, and work. Identifying interventions for child marriage that draw from rigorous science on its multilevel determinants and adding robust measures of gender empowerment to adolescent health programs can enable policies to end child and early marriage in India and can help break the cycle of vulnerability and undernutrition faced by girls in India[27].

CONCLUSION

Pregnancy among teenagers is both a medical and a public health concern that might negatively impact the social and physical development of the mother and affect reproductive quality within a given society. We should take steps not only to improve the reproductive outcome but also to decrease the incidence of teenage pregnancy by increasing public awareness, ensuring female education, and enforcing marriage law. Teenage pregnancy needs to be tackled as a priority to ease the burden of socioeconomic and health problems[1].

Further, the issue of teenage pregnancy may pose a burden on the nation as a whole, mainly due to pressure on available medical facilities as well as the national economy. Additionally, national family planning programs may get adversely affected because of a longer reproductive period and the high fertility rate among teenagers. The foregoing discussion indicates that studies highlighting the risks of teenage pregnancy are scanty, more so from developing countries. Teenage pregnancies are often seen in socio-economically deprived communities where teenage girls are undernourished and also show delayed growth and development as evidenced by delayed menarche. Studies in such communities are of great value. However, obtaining reliable information regarding some of the important parameters like maternal age, age at menarche, pre-pregnancy weight, prenatal weight gain, etc is difficult due to widespread female illiteracy and ignorance about implications of their health problems. Attempts have been made to examine the influence of individual maternal factors on pregnancy outcomes, however combined effects of various factors are yet to be understood. Interactions of these factors are required to be investigated concerning nutritional as well as the socio-economic status of the mother. This may be of great help for the planners to formulate appropriate programs and strategies for combating the problem of teenage pregnancy.

While there is no evidence to date of medical interventions that can specifically improve pregnancy results, the obstetrician providing care for women in this age group should be aware of the potential challenges. Antenatal care must be tailored to the individual needs of this group, particularly about encouraging early and regular attendance, smoking cessation programs, counseling regarding the risk of STIs, and future contraception[19].

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How to cite this article:

M.A. Firdaus and Sunita Mishra (2020) ' Teenage Pregnancy: Some Associated Risk Factors- A Review', *International Journal of Current Advanced Research*, 09(08), pp. 22906-22913. DOI: <http://dx.doi.org/10.24327/ijcar.2020.22913.4529>
