



Contents lists available at [ScienceDirect](#)

Journal of Adolescence

journal homepage: www.elsevier.com/locate/jado



Conduct disorder symptoms and subsequent pregnancy, child-birth and abortion: A population-based longitudinal study of adolescents

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A B S T R A C T

Keywords:

Abortion
Pregnancy
Conduct disorder symptoms
Women
Adolescence

Research on teenage pregnancy and abortion has primarily focused on socio-economic disadvantage. However, a few studies suggest that risk of unwanted pregnancy is related to conduct disorder symptoms. We examined the relationship between level of conduct disorder symptoms at age 15 and subsequent pregnancy, child-birth and abortion. A population-based, representative sample of Norwegian adolescent girls ($N = 769$) was followed from early adolescence until their mid-20s. Even with control for socio-demographic and family variables, conduct disorder symptoms at age 15 were strongly associated with pregnancy in the 15–19 age group, and a weaker association persisted in the 20–28 age group. Similar results were obtained for abortions, but here a strong relationship with conduct disorder symptoms was found even after age 20. After adjustment, no significant association between conduct disorder symptoms and subsequent child-birth was observed. More targeted preventive programmes aimed at girls with conduct disorder symptoms may be warranted.

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Introduction

Countries such as the USA (Coleman, 2006) and UK (Tripp & Viner, 2005) struggle with high teenage pregnancy and birth rates. In Norway, the birth rate in the 15–19 age group has fallen steadily from 40 per 1000 around 1960 to less than 10 per 1000 in 2008 (SSB, 2009c), whereas the rate of abortions in the same age group over the last two decades has remained relatively stable at 15–20 per 1000 (SSB, 2009b). Norway is usually regarded as a welfare state, with mandatory education on sexuality and contraception provided in the schools. Contraceptives and sexual health services for youth are easily available. Even so, the abortion issue has received considerable attention in public policy in Norway.

A recent review of some relevant European studies, although over-represented by the UK, identified four main groups of risk factors associated with teenage pregnancy: (i) socio-demographic, (ii) family structure and stability, (iii) educational and (iv) risky health behaviours (Imamura, Tucker, & Hannaford, 2007). The most consistent risk factor for early pregnancy was lower socio-economic status, while family disruption, school problems and school drop-out were also consistent predictors. Lifestyle factors (e.g., risky sexual behaviours, alcohol, drug use) were also shown to be associated with teenage pregnancy, but they tended to coincide with socio-economic disadvantage, disrupted family structure and limited education. Thus, the independent effects of these factors remain unclear.

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A somewhat surprising aspect of this review was the absence of studies on possible associations between teenage pregnancy and antisocial behaviour and conduct disorder (CD). Until recently, the bulk of research in this area has focused primarily on males (Lacourse, Nagin, Tremblay, Vitaro, & Claes, 2003). However, a number of recent studies have linked CD among young girls to a wide range of poor outcomes in adulthood (Odgers, Moffitt, Broadbent, & Dickson, 2008). Both so-called homotypic and heterotypic continuities have been revealed (Caspi & Moffitt, 1995). CD symptoms related to early adolescent aggression, vandalism, and rule breaking may persist throughout the teenage and early adult years (homotypic pattern), but such tendencies may also be expressed in new ways later in life (heterotypic pattern). Early studies typically did not investigate this heterotypic pattern and concluded that outcomes are better for girls with CD than for boys (Havinghurst, Bowman, Liddle, Matthews, & Pierce, 1962; Morris, 1964; Thomas, 1937).

Research shows that conduct-disordered girls have increased risk of substance dependence and social welfare dependency (Moffitt, Caspi, Rutter, & Silva, 2001; Odgers et al., 2008). In addition, they often develop problems within intimate relationships (Fontaine, Carbonneau, Barker, & Vitaro, 2009), and a three- to five-fold increased risk of teenage pregnancy has been reported (Bardone et al., 1998; Woodward & Fergusson, 1999; Gaudie, Mitrou, Lawrence, Stanley et al, 2010; Bradshaw, Schaeffer, Petras, & Jalongo, 2010). In young adulthood, they often develop unstable family relationships, and often express antisocial behaviours in the context of close relationships (Ehrensaft, 2005).

The main components of CD are aggressiveness, antisocial behaviours, social maladjustment and criminality (Moffitt, Arseneault, Jaffee, & Kim-Cohen, 2008). In the six DSM manuals published so far, the disorder has been conceptualized in different ways, and the symptoms have been in some degree altered. It is considered the most stable form of all psychosocial disorders during childhood and adolescence. All diagnostic systems require a certain number of symptoms to fulfil the criteria for a diagnosis. However, at the same time, a categorical diagnosis of CD versus: variation in severity of dysfunction among children falling below and above the cut-off is lost; distinct categories can create a false impression of change in a disorder's course over time; the cut-off point must inevitably be a matter of convention, and no studies have found evidence for a categorical threshold point along the distribution of CD symptoms (Moffitt et al., 2008: 21). Thus, in the present study, we utilize a more fine-grained measure of CD symptoms.

What is it, more precisely, that puts girls with antisocial tendencies and CD symptoms at risk for unwanted pregnancy? Previous studies have suggested that such associations may arise through two pathways (Bardone et al., 1998; Woodward & Fergusson, 1999). First, girls with such symptoms may come from disadvantaged family backgrounds. Second, these girls may be involved in risky behaviours, related to use of substances, unprotected sex and interpersonal violence. The empirical evidence is, however, not very consistent. Bardone et al. (1998) found that control for family background (socio-economic status, age at menarche, absence of a father figure, religiosity and being a daughter of a teenage mother) had virtually no impact on the estimated association between CD symptoms and pregnancy before age 21. According to Woodward and Fergusson (1999), however, control for family background (maternal educational qualifications, number of parental changes from birth to age 8, and maternal endorsement of punishment at age 3) led to a very substantial reduction in this association. Only Woodward and Fergusson controlled for risky behaviours (sexual intercourse before age 16 and number of sexual partners). Control for these variables (in addition to family background) led to a further, but smaller, reduction in the estimated impact of CD symptoms.

In addition to the behavioural variables considered by Woodward and Fergusson, impulsivity and low self-control have been suggested as core characteristics in CD (White et al., 1994). Longitudinal studies from Scandinavian countries (Pulkkinen, Virtanen, Klinteberg, & Magnusson, 2000) have provided evidence that impulsivity is an important predictor for later norm-breaking behaviour.

A special challenge in this research area is the high co-occurrence of CD symptoms and depressive symptoms (Wolff & Ollendick, 2006). Whereas CD symptoms are related to aggression and other delinquent acts, symptoms of depression, such as sadness and loss of energy, relate to internalized feelings (APA, 1987). Still, these seemingly different symptoms are often co-morbid. Furthermore, females with depressive symptoms in adolescence have an elevated risk of early pregnancy (Fergusson & Woodward, 2002). Thus, when investigating the relationship between CD symptoms and early pregnancy, child-birth and abortion, it is necessary also to consider the level of depression.

The majority of teenage pregnancies are unintended (Henshaw, 1998). However, few researchers have compared predictors of pregnancy resolution, i.e., whether birth or abortion is chosen (see e.g., Bradshaw et al., 2010). A longitudinal American study found, contrary to expectations, that socio-demographic, educational and family closeness variables did not predict subsequent outcome among those with an unwanted pregnancy (Coleman, 2006). Some studies have revealed that the choice of abortion may be associated with higher educational attainment by the woman's mother (Zavadny, 2001) and with high educational aspirations of the adolescent (Eisen, Zellman, Leibowitz, & Chow, 1983; Sihvo, Bajos, & Ducot, 2003). On the other hand, girls with high levels of CD symptoms may also perceive themselves as unstable and little suited for the task of motherhood. Thus, the resolution of an unwanted teenage pregnancy may be an ambiguous phenomenon.

We may hypothesize that teenage pregnancy is associated with factors such as CD symptoms. However, the decision to abort by teenage girls who become pregnant may be more typical in conduct-disordered girls with a high level of socio-economic resources than in those with fewer resources. Note that in the Scandinavian countries, the majority of teenage pregnancies result in an abortion (Danielsson, Rogala, & Sundstrom, 2001; SSB, 2009a), while in the USA, for example, the situation is reversed, with only 35–40% of pregnancies aborted (Coleman, 2006). Moreover, in recent years the US teenage birth rate has increased somewhat (Manlove, Ikramullah, Mincieli, Holcombe, & Danish, 2009).

Previous research has a number of limitations. First, many studies on teenage pregnancy and abortion are of poor quality (Imamura et al., 2007), and many are non-representative, with subjects drawn from clinical populations. Second, the

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