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Introduction

Adolescence is a transitional period of major importance for learning how to interact within intimate romantic and sexual relationships. Decision-making about engaging in sexual activity is a complex process influenced by multiple individual, social, and cultural factors (Marston and King 2006; Hawes et al. 2010; Pinquart 2010; Tolman and McClelland 2011; Madkour et al. 2014).

Early sexual intercourse has been associated with engagement in risk behaviours (e.g., unprotected intercourse; substance use; violence), negative health outcomes, for instance sexually transmitted infections (STIs), unplanned pregnancy, poor mental health, and lower educational attainment (Wellings et al. 2001; Madkour et al. 2014; Ramiro et al. 2015; Vasilenko et al. 2016; Young et al. 2018).

While using chronological age to assess the 'earliness' of sexual initiation is consistent with the use of legal age of consent, it overlooks other important individual and social level differences in sexual transition (Dixon-Mueller 2008; Hawes et al. 2010), such as subjective feelings about the timing of first intercourse. Although many people evaluate first intercourse positively, some report negative experiences. In studies on heterosexual intercourse, females and those who were younger at the time of first intercourse were more likely to report negative experiences. For example, in a Canadian retrospective survey (Reissing et al. 2012), men were more likely to report excitement (66.4%), pleasure (58.6%) and happiness (55.9%) while in women, regret (70.7%), excitement (39.1%) and happiness (36.3%) were the most frequent feelings (Reissing et al. 2012). The negative feeling about

the timing, i.e., it should have happened later or not at all, can be related to different reasons (e.g. the partner, the degree of control, what was expected in term of sexual experience). In a nationally representative sample of 16–24-year-olds in Britain, 20.4% of males and 41.8% of females reported regret about the timing of first intercourse. Moreover, 6.6% of males and 22.1% of females reported that their partner was more willing to have sex than they were. Both unequal willingness and regret were higher among those who were younger at the time of first intercourse (Wellings et al. 2001). Similar gender patterns and a negative association between age at sexual initiation and regret were documented in Scottish and English adolescents aged 13–16 (Wight et al. 2008). Although few studies have explored how social class and family composition were associated to regret about the timing of first intercourse, early sexual intercourse has been found to be more frequent among adolescents who did not live with both biological parents and those who were socially disadvantaged (Hawes et al. 2010).

A negative experience of first intercourse can be an indicator of a lack of sexual competence. This may also influence later sexual experiences (Wight et al. 2008; Reissing et al. 2012). Higher levels of anxiety and negativity (e.g., pressure, detachment, regret) at first intercourse were associated with lower current sexual functioning among young people aged 18–22 in the US (Smith and Shaffer 2013).

Contextual factors may also influence decision-making about first intercourse. The age difference between sexual partners at first intercourse can be a potential source of unequal power distribution in the relationship (Abma et al. 1998). Although the definition of an 'older partner' largely varied, previous studies indicated that girls reported an older first partner more frequently than boys (Wight et al. 2008; Reissing et al. 2012). Having an older first partner has been associated with early sexual initiation and risk behaviours (Kaestle et al.

2002; Mercer et al. 2006; Morrison-Beedy et al. 2013) and with higher incidence of STIs and unplanned pregnancies among girls (Manlove et al. 2006; Volpe et al. 2013; Guleria et al. 2017). It has also been associated with sexual risk behaviours among women in their later adult life (Senn and Carey 2011).

Studies exploring psychological factors surrounding first intercourse also largely vary in their scope and design, as well as the population and contextual factors investigated.

Qualitative investigations demonstrated the complexity of decision-making process, which is influenced by dominant gender norms of masculinity and femininity, career aspirations, ethnic identity, and age (Templeton et al. 2017). Early sexual initiation has been associated with pressure and the feeling of regret. Girls, younger adolescents and those with an older first partner more frequently reported feeling pressured by their partner to have sex. This pressure was associated with regret about the timing of sexual initiation (Wight et al. 2008).

Sexual social norms are also important to consider. Legal age of consent varies between countries: it is 14 years-old in Bulgaria, 15 in France, 16 in Scotland and 17 in Ireland (Graupner 2000), and normative attitudes regarding an 'appropriate' age for sexual initiation differ as well. However, there is generally low social acceptance for sexual initiation before the age of 16 (Widmer et al. 1998; Madkour et al. 2014). Sociological studies have demonstrated that youth sexual behaviours are embedded in norms established within a social context and that shame and guilt are more commonly reported during adolescence when sexual activity contradicts individual, family and social normative expectations (Widmer et al. 1998; Shoveller et al. 2004). Comprehensive sexuality education (CSE), including gender, power and rights, is essential to empower young people and help them to make healthy and informed decision (Haberland and Rogow 2015). However, variations in access to and content of CSE were also documented between European

countries. More specifically, sexuality education was not mandatory in Bulgaria and United-Kingdom while it was in France and Ireland) (Parker et al. 2009).

Overall, literature shows that negative feelings about the timing of first intercourse is associated with circumstances surrounding sexual initiation and gender. Using data from the 2013/2014 Health Behaviour in School-aged Children (HBSC) study, we investigated the association between adolescents' perception about the timing of their first intercourse with sociodemographic and contextual factors. These included gender, family affluence, family structure, age difference between partners, and country of residence. Based on previous literature, we expected that prevalence of negative feelings about the timing of first intercourse would be higher among girls. Given that family structure, socioeconomic status and intercourse with an older partner have been associated with early sexual intercourse and/or pressure, we anticipated that negative feelings would be more frequently reported in adolescents who did not live with both parents, in those who were socially disadvantaged and in those who had an older partner at first intercourse. Finally, because of differences in legal age of consent and CSE, we hypothesized that prevalence of negative feelings about the timing of first intercourse would vary between countries.

Method

Sample and data collection

The Health Behaviour in School-aged Children (HBSC), a WHO collaborative study, uses a standardized research protocol (Currie et al. 2014) and was conducted in 42 countries and regions across Europe and North America in 2013–2014. The study measured a wide range of adolescents' behaviours, including sexual health. Each country and region participating in the study used cluster random sampling (schools or classes as primary

sampling units) to provide a nationally representative sample of adolescents aged 11, 13 and 15. Data are collected on a voluntary and anonymous basis through a standardized questionnaire administered in classrooms. The study design has been fully documented elsewhere (Currie et al. 2009; Roberts et al. 2009; Currie et al. 2014). Sexual health was investigated only in the 15-year-old age group (from 14.5 to 16.4). Optional items on contextual factors surrounding first intercourse were introduced in 2013–2014 to assess adolescents' perceptions about the timing of their first intercourse and partner's age at first intercourse.

Inclusion criteria

The present analysis includes adolescents from the four countries (Bulgaria, France, Ireland and Scotland) that asked the optional items exploring the context of first intercourse. The original sample (N=6,073) was restricted to adolescents who reported having had sexual intercourse (N=1,500). The median age for sexual maturation (puberty) in European countries is around 13 years for girls and 12 years for boys, and sexual encounters before that age may be precocious (Parent et al. 2003). In addition, we speculate that reporting sexual intercourse may include cases of potential non-consensual sexual experience. As we did not measure sexual consent in this study, only adolescents who reported first intercourse at 13 years or older were included (N=1,321).

Variables

Context of first sexual intercourse

Three measures were used to inform the context of first intercourse: perception about its timing (Bajos and Bozon 2008), respondent's and partner's age at that time.

Young people were asked “When you first had sexual intercourse, would you personally say...” with five response categories : (1) “you wanted it to happen earlier”, (2) “you wanted it to happen at that time”, (3) “you would rather have had it later”, (4) “you did not really want to have intercourse” and (5) “you did not ask yourself that”. In Scotland, the response category “you did not really want to have intercourse” was not included. Since present tense was used in response options (1), (2) and (4), young people could refer to what they felt just before, during or just after first intercourse when answering the question. The variable was dichotomized to combine adolescents who reported negative feelings about the timing of their first sexual intercourse (response categories (3) and (4): those who would rather have had intercourse later or they did not really want to have intercourse) compared to the other response categories ((1)+(2)+(5)).

Age of sexual initiation was measured by the question “How old were you when you had sexual intercourse for the first time?” Response categories ranged from “11 or younger” to “16 or older”.

Partner’s age at first intercourse was assessed with the question “How old was your partner when you had sexual intercourse for the first time?” Response categories ranged from “11 or younger” to “20 or older”. Adolescents could also report “I do not know” and those who chose this option were considered as missing for the analysis. In Ireland, the question was left open: young people had the opportunity to write the age in years or to tick “I do not know”. Data were recoded to fit with the categories included in the original question. Categorical variables about age of sexual initiation and partner’s age were transformed in quantitative variables where “11 or younger” was recoded as 11, “12 years old” as 12, ... and “20 or older” as 20. The three sexual behaviour questions were developed

by the HBSC Sexual Health Focus Group and have been tested in a pilot study in six European countries (Young et al. 2016).

The age difference between partners at first intercourse was calculated as partner's age minus adolescent's age. The age difference ranged from -4 years (partner was 4 years younger than respondent) to +7 years (partner was 7 years older). As very younger and very older partners were rarely reported, this variable was dichotomized using the cutoff applied by Morrison-Beedy et al (2013) to separate adolescents whose partner was older by 2 years or more and adolescents whose partner was younger, same age or older by less than 2 years.

Sociodemographic characteristics

The Family Affluence Scale (FAS) is a measure of family wealth used in adolescent surveys. The FAS is composed of six items (e.g. whether the respondents have their own bedrooms or how many cars owns the family) and has been validated in Europe (Torsheim et al. 2016). The score, ranging from 0 to 13, was transformed into a riddit-based relative score. In each country, the lowest 20% identified the young people in the low affluence level, middle 60% those in the medium level and the highest 20% those in the high level (Inchley et al. 2016).

Family structure comprised four categories: living with both biological parents, stepfamily, single parent, or in any other family structure. This variable was subsequently dichotomized into adolescents living with both biological parents and adolescents living in other family environments.

A four-category nominal variable, representing the four countries, was included in the analysis (Bulgaria, France, Ireland and Scotland). As the prevalence of negative feelings

about the timing of first intercourse was the lowest among French adolescents, France was used as the reference category.

Statistical Analyses

The relationships between negative feelings about the timing of first intercourse and gender, family structure and affluence, having an older partner and country were first assessed using Pearson's chi-square test and univariate logistic regression models. Effect sizes were estimated using Cramer's *V*. To further assess associations observed in the univariate analysis and potential confounding effects of associated factors with a *p*-value lower than .20, a multivariate logistic regression model was applied. Threshold for the interaction test in the multivariate model was set at 5%. No interaction with gender or with country was found and stratified analysis for gender or for country did not bring any additional information. Adjusted odd-ratios (OR) are presented with 95% confidence intervals and the *p*-value of the Wald's test. Collinearity and fitting of the model were verified. All statistical analyses were performed with STATA/IC software (Version 14.0, StataCorp LP, Texas, USA). Overall, proportions of missing values were low (see Table 1).

Results

A total of 6,073 participants (mean age=15.6, SD=0.34) were included in this study out of which one fifth reported having had sex (21.8%; mean age=15.6, SD=0.31). This proportion varied significantly between countries, although the effect size was small (14.7% in Ireland, 20.0% in France, 24.2% in Scotland and 27.1% in Bulgaria; $p < 0.001$; Cramer's $V = 0.11$). Boys reported intercourse more frequently than girls (25.3% vs 18.6%; $p < 0.001$). This gender difference was statistically significant in all countries except in Scotland (data not shown).

Nearly a third of sexually initiated adolescents reported first intercourse with a partner at least two years older than them (Table 1). This proportion was lower among boys than girls (21.1% vs 44.7%, $p < 0.001$). Significant gender differences were found in Bulgaria (respectively, 25.5% vs 77.7%, $p < 0.001$), in France (20.2% vs 47.4%, $p < 0.001$) and in Ireland (14.3% vs 30.3%, $p < 0.001$). In Scotland, the difference was weaker and not statistically significant (24.2% vs 29.6%, $p = 0.47$).

Feeling that first intercourse had happened at the right time was the most frequently reported response (43.8%) (Table 1). Around 10% of adolescents reported they wanted it to happen earlier, and one quarter did not ask themselves that question. Around 20% reported they wished first intercourse to happen later or that they did not really want to have it at that time. Adolescents' socioeconomic characteristics, having had an older partner and feelings about the timing of first intercourse varied significantly between countries, although these effect sizes were small (Cramer's $V < .20$).

Univariate analysis showed that the proportion of adolescents who reported negative feelings about the timing of their first intercourse was more than three times higher among

girls compared to boys (Table 2). Adolescents whose family had a low level of affluence were more likely to report negative feelings than those with a medium or high level of affluence. Negative feelings were more likely to be reported by adolescents who reported first intercourse with a partner at least 2 years older compared to those whose partner was less than 2 years older. The association between negative feelings and country was not globally significant, although pairwise comparisons showed that Irish adolescents reported negative feelings significantly more frequently than French adolescents (24.1% vs 15.9%; $p < 0.03$).

In the multivariate logistic regression, being a girl and living in a family with a low level of affluence remained associated with increased odds of reporting negative feelings about the timing of first intercourse (Table 2). After controlling for the potential effect of co-variables, the odds of negative feelings was four times higher among girls compared to boys. The association with age difference between partners was weaker and became statistically non-significant. After adjustment for all covariates, the odds of negative feelings did not vary across countries.

Discussion

Adolescence is a major transitional period when considering sexual development. To our knowledge, this is the first study which explored young people's feelings about the timing of first intercourse using standardized data collection across four European countries. Although in each country young people frequently reported they wished first intercourse to happen at that time, still around one fifth of adolescents reported they would rather have had sex later or they did not really want to have intercourse.

Consistent with our first hypothesis, a strong difference between genders was identified in perception about the timing of first intercourse. Family affluence and country were introduced to control for potential confounding effect on the relationship between gender and negative feelings about the timing of first intercourse. Age difference between partners was introduced for the same reason but especially because it could have mediated this relationship. After taking these covariates into account, the odds of negative feelings were still four times higher among girls. This was consistent with other studies, where men reported more positive perceptions of first intercourse, while women had more negative feelings (Higgins et al. 2010; Reissing et al. 2012). A longitudinal survey found that although women's evaluation of first intercourse tended to improve between 1996 and 2012, guilt and anxiety related to first intercourse were still more frequently reported by women (Sprecher 2014). Other quantitative and qualitative studies brought evidence that a sexual 'double standard' persisted among young people. For the same sexual behaviours, males would be socially rewarded, while females would more likely be blamed (Hird and Jackson 2001; Shoveller et al. 2004; Marston and King 2006; Kreager and Staff 2009; Kreager et al. 2016; Templeton et al. 2017).

While studies found that adolescents who did not live with both parents and those from lower socioeconomic status engaged earlier in sexual behaviours (Hawes et al. 2010), few studies have explored how negative feelings about the timing of first intercourse may vary according to social class or family composition. We found no association with family structure, while adolescents living in low-income family more frequently reported negative feelings than those living in more affluent families. These results were partly consistent with a study among Scottish young people that found no association with between sexual initiation and family structure and social class (Wight et al. 2000). However, a qualitative study documented that young women, particularly those of lower social status, were more likely to be shamed or blamed when their sexual behaviours did not meet social norms (Shoveller et al. 2004). Further studies are needed to explore the issue of social inequalities in reporting negative feelings about the timing of first intercourse.

In line with our second hypothesis, we also found that negative feelings were associated with having an older first partner when univariate analysis was applied. However, after controlling for the co-variables, the association became weaker and non-significant. This may be explained by the confounding effect of gender. When we adjusted the model exclusively for family affluence and country, the association between negative feelings about the timing of first intercourse and an older first partner remained statistically significant (data not shown). Only addition of gender into the model changed the association to non-significant. This observation highlighted that independently of having an older partner, still more girls than boys reported a more negative first experience.

Beyond, most of the partners, even if older than the respondents, were still adolescents themselves (89.0% were aged 17 years or younger) and we did not explore

whether it was the first intercourse for them, too. Studies found that more positive experience and less regret were reported when first intercourse occurred for both partners (Dickson et al. 1998). More research in this area is needed to understand how prior experience of the partners influences adolescents' feelings about first intercourse.

It was hypothesized that negative feelings about the timing of first intercourse would vary between countries because differences in legal age of consent and CSE were documented. Univariate analysis showed that negative feelings were more frequently reported by Irish and Scottish compared to French adolescents. In the multivariate analysis, no statistically significant difference was found between countries. Again, this could be due to the confounding effect of gender. When adjusting for family affluence and the age difference between partners, the association between negative feelings and country remained statistically significant. Odds were higher among Scottish and Irish adolescents compared to French respondents (data not shown). Only when gender was added in the model did the association become non-significant. In this case, the lack of association between countries and negative feelings could be explained by the fact that the proportion of girls was higher than the proportion of boys in Irish and Scottish samples, while it was lower in Bulgarian and French ones. Our findings did not support the hypothesis that macro level indicators related to sexual social norms could have an impact on how adolescents retrospectively perceived the timing of their sexual initiation. However, including more countries to increase the diversity in cultural norms would be necessary to determine this.

Strengths and limitations

An important strength of this study is that data were collected using a standardized protocol which made comparisons between countries possible. The relatively young age of

the adolescents in the sample limited the recall bias for the perceptions about the timing of first intercourse. Time plays an important role in the way people retrospectively perceive past events. Because our sample was young, the time interval between sexual initiation and retrospective feeling was shorter than in surveys among adults. We cannot estimate if participants' reports would have differed if they would have been interviewed at an older age. The theory of socioemotional selectivity, however, suggests that autobiographical memories become more positive at older age (Carstensen et al. 2003). Longitudinal surveys exploring changes in reporting about first intercourse with time would be of major interest.

Another limitation is potential biases caused by the use of an open-ended question about partner's age in Ireland and by the absence of the response category "I did not really want to have intercourse" in the item on perception about first intercourse in Scotland. Data were self-reported and subject to social desirability bias. Some studies about regret about first sex have limited the analysis on consented or voluntary (not forced) intercourse (Dickson et al. 1998), or on people who were at least 13 years old at first intercourse (i.e., when the information on voluntariness was not available) (Mercer et al. 2006). Although this sample is limited to adolescents who reported first intercourse aged at least 13 years to avoid including potential non-consensual experiences, we cannot ascertain that all of them were excluded. The range of ages at first intercourse was therefore limited and did not allow the exploration of how the relationship between negative feelings and age difference between partners varied according to age at first intercourse. Sexual orientation was not explored and did not allow to estimate potential association with the feeling about the timing of first intercourse. Further investigations - including other contextual factors surrounding first intercourse (e.g., partner's sexual experience) and factors related to sexual identity, emotional maturity and decision-making process – with a greater diversity in

adolescents' age and countries – are needed to better understand how young people feel about the timing of their first sexual intercourse.

Conclusion

Experience of the first sexual intercourse is one of the most important stages of the transition from adolescence to adulthood. Our findings suggest that sexual transition in adolescence carries potential vulnerability as one out of five adolescents who already had sex reported they would rather have had first sex later or they did not really want to have it. In order to prevent young people from negative experience that could influence later sexual life, sexual education programs need to include developing skills to express their own wishes, to make informed decision on engagement in sexual intercourse, and to become respectful partners, attuned to each other's desires. In that context, special attention should be given to gender and social inequalities.

Competing interests

The authors declare that they have no competing interests.

Ethical approval

Each country obtained approval from institutional or national ethical boards according to national procedures and guidelines and the study is conducted in accordance with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

In all countries, parents were informed about the study. Informed consent was sought from students in Bulgaria. Passive parental consent was obtained in France and Scotland. In Ireland active or passive consent was obtained based on the school's discretion. Young people were informed about the survey and were free to decline participation, leave blank any questions they did not wish to answer, and that they could withdraw from participation at any time if they wished.

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