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The Age of Sexual Initiation Among Polish Youth: The Role of Individual and Social Factors

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Abstract: Understanding the factors influencing the age of sexual initiation among adolescents is crucial for addressing risky behaviours and supporting healthy development. This study aimed to identify determinants of sexual initiation age among Polish adolescents, focusing on gender differences and 15 factors related to lifestyle, family, school, and social environment. The analysis involved 3296 Polish adolescents aged 15–17 who participated in the international Health Behaviour in School-aged Children (HBSC) survey in 2018. The Cox proportional hazard model (aligned with censored data) revealed that frequent use of psychoactive substances is the main predictor of the age of sexual initiation (HR = 5.20; 95% CI: 3.66–7.38), with even moderate use having an impact (HR = 2.81; 95% CI: 2.04–3.86). Gender was not found to significantly influence the age of initiation, but the determinants did vary by gender. For boys, high physical activity and intensive socialising with peers are important factors influencing the age of sexual initiation. For girls, a positive self-assessment of appearance is more strongly associated with earlier initiation, while good academic performance and family support have a delaying effect. Effective intervention programs should consider these diverse determinants since they significantly shape adolescents' decisions about sexual activity and their ensuing psychological experiences.

Keywords: sexual initiation; adolescent sexual behaviour; family and social determinants; factors influencing sexual initiation

1. Introduction

Adolescence is a period when individuals achieve sexual and psychological maturity, and the development of teenage sexuality is deeply intertwined with other aspects of development, such as the formation of morality, values, and identity. This process is shaped by the complex interplay between individuals and their socio-ecological environment [1]. The onset of sexual activity during adolescence is a normative developmental milestone. By the age of 19, nearly 70% of both males and females reported that they had ever had sexual intercourse [2]. Therefore, in this context, the definition of sexual health remains crucial. Sexual health is fundamental to the overall health and well-being of individuals, couples, and families, as well as to the social and economic development of communities and countries. When viewed affirmatively, sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free from coercion, discrimination, and violence [3].

Sexual curiosity during adolescence often leads to engagement in sexual activities or the consumption of sexual content. At this stage, many critical biological and psychological

changes occur, for which many teenagers are not sufficiently prepared, often exposing them to stress [4]. Furthermore, this period, representing the transition between childhood and adulthood, carries health and social implications and requires special attention [5]. The theory of the "maturity gap", which highlights the disparity between accelerated biological development and the lagging psychological and social development of youth, must be considered. This phenomenon becomes particularly evident in the context of ongoing cultural and societal changes in countries such as Poland [6].

Before the age of 20, the vast majority of teenagers in Poland have experienced various sexual behaviours, ranging from intimate kissing, masturbation, touching, and caressing to sexual intercourse. However, there are significant individual differences in the timing of sexual initiation in European societies [7]. Although sexual development, including sexual initiation, is a natural part of adolescence, teenage sexuality is often studied from a health risk perspective [8,9]. It is often assumed that teenage sexuality and related behaviours are inherently problematic, while in reality, they should be recognised as part of a normative developmental process.

From a life-course perspective, the process of sexual development begins in the foetal stage [10] and includes a range of diverse behaviours and stages, with adolescence representing a critical transition in this context [11]. However, since cultural norms regarding sexuality change over time, research should focus on individuals' perceptions of the appropriateness of the timing of their sexual debut, rather than the specific age at which it occurs [12].

Currently, sexual initiation during adolescence and later, both within and outside of marriage, is discussed in various cultural contexts. The emergence of modern contraceptive methods and the availability of abortion procedures have further separated the sexual sphere from the reproductive sphere [13]. It is worth noting, however, that the scientific literature emphasises that sexual initiation can have adverse consequences when sexual behaviours occur at too early an age, not as a conscious decision, in accidental circumstances, or without proper awareness of the associated risks [14,15]. Moreover, different risky health behaviours can co-occur among teenagers, suggesting that there may be a possible temporal and causal sequence between them [16].

Sexual behaviours during adolescence are also largely influenced by contextual factors, especially within the family and school environment [17]. During adolescence, teenagers receive information about sexuality from both formal sources, such as school sex education programs, and informal sources, such as parents and the media [18]. It remains an important fact that in European societies—in Poland, for instance—girls receive more information about sexuality than boys, and the range of topics discussed, both in school and within the family, is limited. Moreover, boys perceive the content as primarily focused on girls' experiences. As a result, they turn to other sources (such as peers, media, and the internet) to educate themselves about sexual issues. Therefore, comprehensive and evidence-based sex education is crucial for supporting the psychosexual development of young people [19,20].

Focusing solely on the negative aspects of sexuality while ignoring its potential beneficial aspects impoverishes the scientific understanding of the process of sexual development during adolescence. Additionally, this may hinder efforts to minimise risks and promote a positive approach to mental and physical health among youth [13]. Furthermore, research findings highlight the urgent need to consider contextual aspects in sexual education strategies offered by health and educational institutions [17]. Providing young people with positive experiences can facilitate interventions, including modifying their behaviours and promoting health-enhancing activities, such as avoiding tobacco use, drug abuse, and excessive alcohol consumption [21].

The Health Behaviour in School-aged Children (HBSC) study provides a unique source of information on the sexual behaviours of adolescents aged 15–16, and the range of collected information is continually expanding [22]. In the HBSC 2017/18 study, Poland recorded one of the lowest percentages of 15-year-olds after sexual initiation among the 33 countries involved. Long-term observations show an increase in this percentage from 2010 to 2014, followed by a decline from 2014 to 2018 [23]. Attempts to identify factors determining early sexual initiation have been made in many countries and cultural circles, including recently in Bulgaria [24], Canada [25], Italy [26], and Ireland [27], often in the context of clusters of risky behaviours. However, these studies focused only on 15-year-olds, and the factors considered mainly included family and school influences. The protocols of subsequent rounds of HBSC studies differ in the set of recommended optional questions, and each country can also choose and include additional national items.

A substantial amount of attention has been dedicated to the examination of the factors that influence the early initiation of sexual activity, a phenomenon that has been defined in various ways across the cited literature. It should be noted that the HBSC study revealed that the age of first sexual contact for adolescents is often around 16 years old. It is therefore recommended that older adolescents be included in the analysis, with a view to observing the frequency and determinants of sexual initiation up to the age of majority, which in Poland is 15 years of age. As is the case in the majority of countries worldwide, the age of sexual initiation has been on a gradual decline, reaching a current range of 15 to 18 years [28]. In countries, such as Poland, that include older age groups in HBSC surveys, the initiation of sexual activity up to the age of 17 has been studied [29].

Our study aims to identify the principal factors influencing the onset of sexual activity among adolescents and to explore the gender-specific determinants of sexual development. This allows for the identification of the elements of daily life and the environment that exert the greatest influence on adolescents' sexual decisions and behaviour. It is of the utmost importance to gain an understanding of these processes in order to safeguard the mental and emotional well-being of adolescents [30]. The lack of comprehensive sex education has been identified as a significant contributing factor to the emotional difficulties experienced by adolescents, including feelings of confusion, embarrassment, and anxiety. Furthermore, adolescents face psychological costs, including the unconscious perpetuation of harmful stereotypes and beliefs about their own and other sex and gender roles. Additionally, they incur behavioural costs that limit their capacity to make responsible decisions, anticipate consequences, and plan for the future [31].

The aim of the present study, therefore, is to present the determinants of the age of sexual initiation among Polish youth aged 15–17, in the light of selected factors characterising their lifestyle and functioning within the family. A range of family factors and risky behaviours, whose significance has been demonstrated in other studies, are considered. An original element is the inclusion of how free time is spent, functioning in social relationships with peers, and the characteristics of the place of residence, as well as adjusting the analyses for self-assessment and academic achievement.

2. Materials and Methods

2.1. Sample

The cross-sectional study involved 3296 (out of 3478) school students aged 15–17 who participated in the Polish edition of the international HBSC survey during the 2017/2018 school year (respondents for whom data were missing for key variables had been excluded). The sample consisted of 46.4% boys and 53.6% girls. The survey was conducted at 138 schools across all of Poland's provinces using traditional paper questionnaires. Participants were from 118 ninth-grade classes (N = 1815) and 84 eleventh-grade classes

(N = 1581). The older cohort was included in the Polish study beyond the international HBSC protocol. The survey procedure was detailed in the national report [32].

2.2. Research Tool

The dependent variable was taken to be the age of first sexual intercourse. In the section of the questionnaire concerning youth sexual behaviours, the question was asked: "Have you ever had sexual intercourse (sometimes this is called 'making love', 'having sex', or 'going all the way')?". If the response was affirmative, the next question was: "How old were you when you had sexual intercourse for the first time?"—with seven possible answers ranging from 11 years or younger to 17 years or older.

As independent variables, in addition to gender (male or female), 15 factors potentially influencing the age of sexual initiation were considered. These included factors related to lifestyle, family characteristics, environment, self-assessment of health and appearance, and selected personal resources. Twelve of these factors were derived from the international protocol, three were national questions, and a total of seven were occasionally analysed in 2018 but were not included in the Polish questionnaire for the newer round of HBSC 2022.

2.3. Lifestyle Questions

Lifetime substance use was considered. For example, the question was: "On how many days (if any) have you drunk alcohol?" Similar questions were asked about smoking cigarettes, e-cigarettes, and marijuana. Although these questions are sourced from the ESPAD survey protocol [33], the response categories differ (never, 1–2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, 30 days or more). A standardised scale (mean 0, SD = 1) was created using Principal Component Analysis (PCA) from four questions about four substances, divided into three intervals. Excessive substance use was defined as a z-score > 1, with 50% of the sample in the middle group. Additionally, there was a question about lifetime episodes of alcohol intoxication: "Have you ever had so much alcohol that you were really drunk?" with five response categories: never; yes, once; yes, 2–3 times; yes, 4–10 times; yes, more than 10 times. These were recoded into three categories: never, rarely (1–3 times), and often (4+).

The factor of whether participants attained the recommended level of physical activity was considered a health-promoting behaviour. The respective MVPA index (moderate to vigorous physical activity), based on the Prochaska test [34], indicates the number of days per week the respondent exercised for at least 60 min. Participants were classified as inactive, low-active, moderately active, or meeting the MVPA criterion of 7 days.

Using an optional block of questions from the HBSC protocol, non-constructive ways of spending free time with peers were examined. Two items from the full block were included in the study after the initial selection process, with those that did not correlate with the age of initiation being excluded in the univariate analysis. The question was: "In your leisure time, how often do you engage in the following activities?". One possible activity was "shopping for fun in shopping malls", with the following responses: daily, several times a week, several times a month, a few times a year at most, or never. These were recoded into never, rarely, and often. Another question concerned organised group activities in free time: "In your leisure time, do you do any of these organized activities?" explaining that: "Organized activities refer to those activities that are done in a sport or another club or organization". Based on six co-occurring responses (team sports, organised individual sports, attending art school/club, youth organisations like Scouts, leisure centres or after-school clubs, church meeting or singing), participants were categorised as having none, one, or two or more activities.

Social engagement was also measured using the social self-efficacy scale devised by Muris [35], containing eight statements with five response categories from "not at all" to "very well". The total scale ranges from 0 to 32 points, divided into three intervals with cut-off points at 16/17 and 25/26. The scale is unidimensional, with a Cronbach's alpha of 0.844 in this sample.

2.4. Questions on Family and Neighbourhood

Four family characteristics were analysed: structure, affluence, social position, and perceived support. Family structure referred to the individuals the adolescent lived with, categorised as follows: intact (both biological parents), step-parent (a mother or father together with a step-parent or partner), single parent, or other. Social position of the family was measured using a visual scale adapted nationally from an international prototype [36] with a ladder ranging from 0 to 10 points, divided into three intervals: 0–5; 6–8; 9–10. Family support was measured using the multidimensional scale of perceived social support (MSPSS) by Zimet et al. [37], focusing on the family dimension. The MSPSS has seven response categories from "very strongly disagree" to "very strongly agree", labelled only at the extremes. The total scale ranges from 0 to 24 points, divided into three intervals: 0–11; 12–22; 23–24. Cronbach's alpha was 0.942.

2.5. Questions on Other Factors

The analyses were also adjusted for academic achievement and self-assessment of health and appearance. Academic achievement was analysed using a visual scale, similar in source and graphic form to the family social position scale, but with a different categorisation: 0–4, 5–7, and 8–10 points. The mandatory question about self-assessed health in the HBSC protocol is "Would you say your health is…?", with response categories: excellent, good, fair, and poor, recoded into three intervals by combining fair and poor. The optional question about self-assessed appearance is: "Do you think you are…?" with response categories: very good looking, quite good looking, about average, not very good looking, not at all good looking, recoded from worst to best assessment.

Below the sample is profiled in terms of the above independent variables, in tables showing the analysis results.

2.6. Statistical Analysis

In the statistical analysis, methods for censored data were utilised. This approach allowed for combining data from youth aged 15 and 17 into one group, enabling more extensive use of the collected information. For respondents who declared sexual initiation, the reported age was used. For those who had not yet experienced initiation, the exact age at the time of the survey was used, treating the observation as censored at that point. Factors influencing sexual initiation were examined using survival analysis methods, also known as time failure models. Potential influencing factors were categorised into three groups as described earlier. In the univariate analysis, the Kaplan–Meier method was used to estimate the age of initiation (with standard errors), calculate the number of censored observations, and compare groups using the Mantel–Cox log-rank test. In the multivariate analysis, the Cox proportional hazards model was applied, presenting adjusted hazard ratios (HR) with 95% confidence intervals (CIs). This approach is widely used in studies on the age of sexual initiation [38]. In Dutch studies, the assumptions required for the Cox model were verified, demonstrating its applicability to the determinants of first sexual intercourse [39].

3. Results

3.1. Prevalence and Age of Sexual Debut

In the analysed sample from the HBSC 2018 study, 12.6% of 15-year-olds and 35.2% of 17-year-olds reported having initiated sexual activity. Among boys, these rates were 16.1% and 38.7%, respectively, and among girls, 9.5% and 32.2%, respectively. The proportion of adolescents who reported early sexual initiation (15 years or younger) was 12.4% among 15-year-olds and 9.0% among 17-year-olds. Among all surveyed 17-year-olds who had experienced sexual intercourse, the proportion of early initiators was 26.2%. Due to their age and censored observations, nearly all the 15-year-olds fell into this category. The average age of sexual initiation, estimated from Kaplan–Meier survival curves for the entire sample, was 17.54 years (95% CI: 17.48–17.60), and the median age could not be estimated.

3.2. Univariate Analysis

Table 1 presents the age of sexual initiation across groups distinguished by demographic factors, lifestyle, and selected personal competencies (academic performance, social self-efficacy), along with comparisons using the Kaplan–Meier method. Boys were found to have initiated sexual activity earlier than girls, with a mean age of 17.37 years for boys and 17.68 years for girls ($p < 0.001$). Adolescents who frequently used psychoactive substances and experienced numerous episodes of alcohol intoxication were found to have initiated sexual activity earlier. The mean age of initiation for those with excessive substance use was 16.58 years, while for those with no or rare use it was 18.23 years ($p < 0.001$). Similarly, those who had been drunk four times or more had a mean initiation age of 16.74 years compared to 18.03 years for those who had never been drunk ($p < 0.001$).

Table 1. Sexual debut among adolescents aged 15–17 in relation to demographic characteristics, factors, relationship with peers, and school performance.

	Sample		Sexual Debut			Age of Debut		Log-Rank χ^2 * (*p* *)
	N *	%	Debut N *	Censored N *	Censored %	Mean *	SE *	
Gender								
Boys	1525	46.2	404	1121	73.5	17.37	0.049	19.641
Girls	1774	53.8	359	1415	79.8	17.68	0.038	(<0.001)
Grade								
9 *	1760	53.3	222	1538	87.4	16.94	0.080	0.198
K11 *	1539	46.7	541	998	64.8	17.54	0.039	(0.656)
Lifetime experience with substance use								
Never or rarely	1030	31.2	51	979	95.0	18.23	0.037	396.729
Moderate frequency	1640	49.7	373	1267	77.3	17.60	0.042	(<0.001)
Excessive use	629	19.1	339	290	46.1	16.58	0.069	
Lifetime experience with getting drunk								
Never	1750	53.1	165	1585	90.6	18.03	0.035	297.688
1–3 times	994	30.1	303	691	69.5	17.39	0.055	(<0.001)

Table 1. *Cont.*

	Sample		Sexual Debut			Age of Debut		Log-Rank χ^2 * (*p* *)
	N *	%	Debut N *	Censored N *	Censored %	Mean *	SE *	
4 times or more	555	16.8	295	260	46.8	16.74	0.079	
MVPA *								
0–4 days	2187	66.3	471	1716	78.5	17.65	0.035	42.046
5–6 days	741	22.5	171	570	76.9	17.46	0.069	(<0.001)
7 days	371	11.2	121	250	67.4	16.88	0.103	
Unstructured activity with friends								
Rarely or never	714	21.7	149	565	79.1	17.58	0.067	35.536
Sometimes	2228	67.5	491	1737	78.0	17.61	0.035	(<0.001)
Often	357	10.8	123	234	65.5	16.95	0.102	
Organised leisure activity								
0	1367	41.4	308	1059	77.5	17.64	0.044	11.033
1	1060	32.1	246	814	76.8	17.54	0.053	(0.004)
2+	872	26.5	209	663	76.0	17.30	0.066	
Social self-efficacy								
Low	783	23.7	170	613	78.3	17.58	0.064	33.827
Average	1771	53.7	360	1411	79.7	17.65	0.040	(<0.001)
High	745	22.6	233	512	68.7	17.25	0.066	
Academic achievement								
Poor	637	19.3	211	426	66.9	17.19	0.072	38.090
Average	1782	54.0	415	1367	76.7	17.55	0.040	(<0.001)
Good or very good	880	26.7	137	743	84.0	17.77	0.058	

* N—number of participants; * mean—arithmetic mean; * SE—standard error; Log-rank; χ^2—log-rank chi-square; *p*—*p*-value; * 9—ninth-grade classes; * K11—eleventh-grade classes; * MVPA—moderate to vigorous physical activity.

Physical activity also significantly influenced the age of initiation. The mean age for those active 0–4 days per week was 17.65 years, compared to 16.88 years for those active every day ($p < 0.001$). Early sexual initiation was also associated with frequent involvement in unstructured activities with friends, such as hanging out at shopping malls. Adolescents who often engaged in these activities had a mean initiation age of 16.95 years, compared to 17.58 years for those who rarely or never engaged in such activities ($p < 0.001$).

Participation in organised leisure activities showed a gradient effect; those involved in no organised activities had a mean initiation age of 17.64 years, compared to 17.30 years for those involved in two or more activities ($p = 0.004$). The most socially adept adolescents were found to have initiated sexual activity earlier, with those having high social self-efficacy initiating at a mean age of 17.25 years, compared to 17.65 years for those with average self-efficacy and 17.58 years for those with low self-efficacy ($p < 0.001$).

Academic achievements acted as a protective factor, showing a linear relationship: the better the academic performance, the later the age of sexual initiation. Adolescents with poor academic achievement had a mean initiation age of 17.19 years, compared to 17.77 years for those with good or very good academic performance ($p < 0.001$).

Table 2 similarly compares groups based on self-rated health and appearance, family, and residential characteristics. The relationship with family structure proved to be on the borderline of significance ($p = 0.058$). Adolescents from reconstructed families or other non-traditional family situations were found to have initiated sexual activity earlier than those living with both biological parents or a single parent. Better self-rated health and appearance, as well as higher family social position, also contributed to earlier initiation, with non-linear relationships showing the latest initiation age in the average group. Low family support was also found to be a factor decreasing the age of initiation, with a small difference between adolescents reporting average and high support.

Table 2. Sexual debut among adolescents aged 15–17 in relation to self-rated health and appearance, and family and residential characteristics.

	Sample		Sexual Debut			Age of Debut		Log-Rank χ^2 * (p *)
	N *	%	Debut N *	Censored N *	Censored %	Mean *	SD *	
Self-rated health								
Excellent	519	15.7	152	367	70.7	17.25	0.086	20.104
Good	2047	62.1	421	1626	79.4	17.64	0.037	(<0.001)
Fair or poor	733	22.2	190	543	74.1	17.47	0.066	
Self-rated appearance								
Poor	430	13.0	82	348	80.9	17.60	0.082	51.894
Average	1222	37.1	218	1004	82.2	17.77	0.045	(<0.001)
Good	1647	49.9	463	1184	71.9	17.33	0.045	
Family support								
Low	791	24.0	230	561	70.9	17.28	0.068	20.999
Average	1780	53.9	378	1402	78.8	17.62	0.040	(<0.001)
High	728	22.1	155	573	78.7	17.51	0.059	
Family social position								
Low	711	21.6	162	549	77.2	17.56	0.066	28.174
Average	1953	59.2	418	1535	78.6	17.64	0.037	(<0.001)
High	635	19.2	182	452	71.2	17.16	0.078	
Family structure								
Intact	2509	76.1	553	1956	78.0	17.59	0.034	
Step-parent	181	5.5	52	129	71.3	17.21	0.126	7.491
Single parent	525	15.9	133	392	74.7	17.43	0.080	(0.058)
Other	84	2.5	25	59	70.2	17.03	0.226	
Family affluence								
Low	909	27.9	204	705	77.6	17.60	0.056	2.378
Average	1580	48.5	367	1213	76.8	17.53	0.044	(0.304)
High	770	23.6	182	588	76.4	17.49	0.064	
Place of living								
Rural areas	1346	40.9	300	1046	77.7	17.57	0.048	2.351
Small towns	1105	33.6	268	837	75.7	17.54	0.051	(0.309)
Large cities	839	25.5	192	647	77.1	17.33	0.057	
Neighbourhood SES								
Low	203	6.2	60	143	70.4	17.11	0.131	13.758
Average	2441	74.1	526	1915	78.5	17.62	0.034	(0.001)
High	649	19.7	176	473	72.9	17.30	0.072	

*—missing data for the four last variables; * N—number of participants; * mean—arithmetic mean; * SD—standard deviation; Log-rank χ^2—log-rank chi-square; p—p-value.

3.3. Multivariate Analysis

Table 3 shows the results of multivariate analysis using the Cox method, focusing on statistically significant factors presented in the order of their introduction into the model. Out of the 17 factors analysed, 11 were found to be significant predictors of the age of sexual initiation. The highest hazard ratio (HR) was observed for frequent use of psychoactive substances, with excessive use resulting in a five-fold increase in the likelihood of earlier sexual initiation. Early sexual initiation was also linked to more episodes of alcohol intoxication, high physical activity (7 days of activity per week), frequent socialising with peers, participation in organised activities, and unstructured leisure activities. It was also associated with better self-rated appearance, social self-efficacy (a borderline result included in the final model), and higher family social position. The protective effects of good academic performance and high family support were confirmed in the multivariate analysis. Gender was not included in the final model ($p = 0.189$).

Table 3. Variables most significantly associated with sexual initiation—Cox proportional hazards model.

Factor	Categories	B	SE *	p *	HR *	95% CI for HR *	
						Lower * Bound	Upper * Bound
Lifetime experience with substance use	never or rarely *			<0.001			
	moderate use	1.033	0.162	0.000	2.81	2.04	3.86
	excessive use	1.648	0.179	0.000	5.20	3.66	7.38
Lifetime experience with getting drunk	Never *			<0.001			
	1–3 times	0.381	0.108	0.000	1.46	1.18	1.81
	4 times or more	0.579	0.123	0.000	1.78	1.40	2.27
Family support	Low *			<0.001			
	Average	−0.348	0.090	0.000	0.71	0.59	0.84
	High	−0.451	0.115	0.000	0.64	0.51	0.80
MVPA *	0–4 days *			0.002			
	5–6 days	0.088	0.092	0.337	1.09	0.91	1.31
	7 days	0.384	0.107	0.000	1.47	1.19	1.81
Academic achievement	Poor *			0.001			
	Average	−0.139	0.088	0.113	0.87	0.73	1.03
	good or very good	−0.416	0.115	0.000	0.66	0.53	0.83
Unstructured activity with friends	rarely or never *			0.001			
	Sometimes	−0.104	0.096	0.283	0.90	0.75	1.09
	Often	0.278	0.126	0.027	1.32	1.03	1.69
Organised leisure activity	0 *						
	1	0.083	0.089	0.352	1.09	0.91	1.29
	2+	0.258	0.094	0.006	1.29	1.08	1.56
Self-rated health	excellent *			0.022			
	Good	−0.254	0.098	0.010	0.78	0.64	0.94
	fair or poor	−0.108	0.120	0.370	0.90	0.71	1.14
Self-rated appearance	Poor *			0.021			
	Average	−0.041	0.133	0.756	0.96	0.74	1.25
	Good	0.355	0.130	0.006	1.43	1.11	1.84
Family social position	Low *			<0.001			
	Average	0.002	0.098	0.986	1.00	0.83	1.21

Table 3. *Cont.*

| Factor | Categories | B | SE * | p * | HR * | 95% CI for HR * | |
						Lower * Bound	Upper * Bound
	High	0.428	0.117	0.000	1.53	1.22	1.93
Social self-efficacy	Low *			<0.001			
	Average	−0.127	0.098	0.193	0.88	0.73	1.07
	High	0.195	0.109	0.073	1.22	0.98	1.50

* refers to the reference category; the *p*-value given here refers to the overall significance of this factor. * SE—standard error; * *p*—*p*-value; * HR—hazard ratio; * 95% CI for HR—95% confidence interval for hazard ratio; * lower bound—lower bound of the 95% CI for HR; * upper bound—upper bound of the 95% CI for HR; * MVPA—moderate to vigorous physical activity.

Additional analyses indicated differences in the impact of various factors on the age of sexual initiation for boys and girls (Table 4). For both genders, greater use of psychoactive substances was found to be the main predictor of the age of sexual initiation, but the respective hazard ratio was significantly higher for girls (HR = 7.05) than for boys (HR = 4.30). More experience with alcohol intoxication was the second most important predictor for girls and much less significant for boys, where high family social position ranked second. Nine factors were identified for boys and seven for girls, with some factors included in the model for only one gender or the other. Only boys showed a significant relationship between the age of sexual initiation and physical activity level (third in importance), participation in organised activities, very good self-rated health, and high family social position. Specific predictors for girls included very good self-rated appearance (third in importance) and better academic performance. A high degree of family support was found to delay sexual initiation in both genders, with a stronger effect in girls, where it ranked fourth. The final models excluded family affluence, both neighbourhood characteristics, and family structure (found to be borderline significant in the general model).

Table 4. Variables most significantly associated with sexual debut in boys and girls—Cox proportional hazards model.

| Factor | Categories | Boys | | | | Girls | | | |
		Rank	HR *	95% CI *	p *	Rank	HR *	95% CI *	p *
Lifetime experience with substance use	never or rarely *				0.000				0.000
	moderate use	1	2.51	1.68–3.73	0.000	1	3.42	2.01–5.84	0.000
	excessive use		4.30	2.73–6.75	0.000		7.05	3.97–12.50	0.000
Lifetime experience with getting drunk	Never *				0.003				0.001
	1–3 times	7	1.38	1.03–1.84	0.030	2	1.67	1.22–2.30	0.002
	4 times or more		1.77	1.27–2.46	0.001		2.01	1.40–2.87	0.000
Family support	Low *				0.007				0.002
	Average	6	0.66	0.51–0.86	0.002	4	0.76	0.60–0.96	0.021
	High		0.71	0.52–0.97	0.029		0.55	0.40–0.78	0.001
MVPA	0–4 days *				0.005				
	5–6 days	3	1.03	0.81–1.31	0.813	-	-	-	-
	7 days		1.51	1.16–1.96	0.002				
Academic achievement	Poor *								0.020
	Average	-	-	-	-	5	0.98	0.76–1.26	0.874
	good or very good						0.64	0.45–0.91	0.013

Table 4. *Cont.*

Factor	Categories	Boys				Girls			
		Rank	**HR ***	**95% CI ***	***p* ***	**Rank**	**HR ***	**95% CI ***	***p* ***
Unstructured activity with friends	rarely or never *				0.028				0.017
	Sometimes	8	0.929	0.74–1.17	0.531	6	0.90	0.61–1.31	0.566
	Often		1.390	1.00–1.99	0.049		1.34	0.87–2.08	0.186
Organised leisure activity	0 *				0.005				
	1	5	1.12	0.87–1.45	0.365	-	-	-	-
	2+		1.51	1.17–1.95	0.002				
Self-rated health	Excellent *				0.002				
	Good	4	0.65	0.52–0.82	0.000	-	-	-	-
	fair or poor		0.71	0.53–0.97	0.032				
Self-rated appearance	Poor *								0.000
	Average	-	-	-	-	3	1.06	0.76–1.49	0.736
	Good						1.72	1.24–2.38	0.001
Family social position	Low *				0.000				
	Average	2	1.20	0.90–1.61	0.211	-	-	-	-
	High		1.80	1.30–2.49	0.000				
Social self-efficacy	Low *				0.030				0.046
	Average	9	0.84	0.64–1.09	0.386	7	0.92	0.69–1.21	0.538
	High		1.14	0.85–1.52	0.188		1.25	0.91–1.72	0.162

* refers to the reference category; the *p*-value given here refers to the overall significance of this factor. * HR—hazard ratio; * 95% CI for HR—95% confidence interval for hazard ratio; * MVPA—moderate to vigorous physical activity.

4. Discussion

Adolescence represents a pivotal phase in human development characterised by profound physical, hormonal, and psychological changes. This transitional period fosters cognitive growth, including the emergence of formal operational thinking and abstract reasoning abilities. Concurrently, adolescents begin to anticipate the consequences of their actions, forge their identities, navigate social interactions, and explore their sexuality [40]. While prevailing research often focuses on early sexual initiation, it frequently overlooks other critical behaviours that may influence sexual activity.

Our analysis, drawing on HBSC data, focuses on the age of sexual initiation among Polish adolescents, revealing that compared to peers in other countries, Polish youth generally commence sexual activity later, with notable disparities between genders. Higher rates of sexual initiation among boys at both 15 and 17 years old align with data from other global studies [41,42]. Additionally, in countries with less progressive gender role attitudes and greater gender inequalities, fewer girls report early sexual initiation, contributing to larger gender differences in these countries [23,43].

In discussing the obtained results, we primarily focused on factors that proved to be significant in the multivariate model of initiation age determinants. Differences in models estimated for both genders were discussed in more detail, while factors that were found to be insignificant were briefly mentioned.

Our findings indicate that adolescents who engage more frequently in psychoactive substance use tend to initiate sexual activity earlier, a trend similarly observed among those with more frequent episodes of excessive alcohol consumption. Notably, we found that excessive alcohol intake disproportionately impacts sexual initiation among girls. Adolescent sexual activity often occurs in settings where psychoactive substances are available [44], with some reports indicating substance use during recent sexual encounters [45]. Those initiating sexual activity early are more likely to engage in substance use during adoles-

cence compared to their peers who initiate later or abstain [46]. Additionally, early sexual debut correlates with a history of drug use [47], underscoring the broad and nonspecific associations between normative sexual behaviours and substance use during adolescence and emerging adulthood [48].

Other studies have also suggested that risky behaviours in young people are often linked to risky sexual behaviours, and the negative consequences of these behaviours seem to be more pronounced in young women [49]. Given that alcohol consumption is prohibited for minors, young women engaging in such behaviour tend to participate in riskier social contexts, such as unsupervised gatherings where older, unfamiliar men may be present [45,50]. In these environments, the belief that alcohol reduces sexual inhibitions and increases the likelihood of casual sexual encounters is pervasive, fostering expectations of engaging in such behaviours [51]. Young women in these settings may feel pressured both internally and externally to engage in sexual activity, irrespective of their actual readiness [52].

Multivariate analyses using the Cox proportional hazards model confirm that adolescents reporting low family support tend to initiate sexual intercourse at a younger age, with a stronger protective effect observed among girls. Parental and familial influences play pivotal roles in sexual development, with sexual socialisation commencing in late childhood and continuing through adolescence, involving parents, siblings, peers, and other significant adults. Notably, the frequency of discussions about sexuality correlates with the quality of parent-child relationships during adolescence, with a notable decrease in the percentage of boys engaging in such discussions when relationships are strained [19]. Adolescents benefiting from comprehensive sex education and robust parental support are more likely to delay sexual initiation, use contraception during their initial sexual experiences, and exhibit social competence in sexual interactions and satisfaction [7,53–55]. Comprehensive sex education should address not only the biological but also the psychological and emotional dimensions of sexuality, equipping young people to engage in safe and fulfilling sexual experiences [56].

Regarding other family-related variables, our study found only a high family social position was found to correlate with earlier sexual debut, particularly among boys. However, reviews in the literature highlight that individuals who begin sexual activity at an early age are more vulnerable to risk factors stemming from family dysfunctions (e.g., conflicts, low parental supervision, and absence of parents) [57–59].

Adolescents engaging in physical activity every day of the week demonstrated earlier sexual debut—a trend more pronounced among boys and those reporting very good health status. This finding aligns well with previous research highlighting physical activity as a significant predictor of early sexual initiation, with adolescents involved in physical activity being more likely to engage in early sex [60,61]. Sports clubs may not only provide an environment conducive to youth physical activity but also serve as spaces where interactions with potential sexual partners occur, thereby facilitating early sexual encounters [60].

Regarding external and environmental factors, adolescents who spent more time with friends or peers had a lower average age of first sexual intercourse. Additionally, those attending organised extracurricular activities, as well as those who spent time with peers in less constructive ways, initiated sexual activity earlier. According to the classical ecological model, many environmental factors, such as leisure time activities, can significantly impact adolescent sexual development, including early sexual initiation [62]. Prospective studies in the United States have shown that adolescents spending more unsupervised time with peers were more likely to engage in sexual intercourse [61,63]. Furthermore, studies have demonstrated the existence of peer effects related to early sexual debut, casual sex, and unprotected sex, confirming that peer characteristics influence sexual activity [64]. Peers

impact adolescent sexuality and sexual behaviours by projecting conventional or deviant lifestyle models, sexual attitudes, and behaviours, and serving as sources of information and social approval or disapproval for certain attitudes and behaviours [65].

School achievements were also found to correlate with the timing of sexual debut. Adolescents with low school achievements initiated sexual activity earlier, with this factor remaining significant only for girls in the model. However, other studies have indicated that abstaining from sex until age 19 and a higher age of first sexual intercourse were stronger predictors of successful development for boys, although still significant also for girls [66]. The negative impact of sexual debut on school attachment and academic performance has also been noted [67].

One particularly interesting finding of our study is that self-rated appearance, when high, was associated with earlier sexual initiation. However, in our model, this was found to be significant only for girls. Body image is a sensitive issue for many individuals, as contemporary Western culture places a strong emphasis on physical appearance. Therefore, both men and women may feel pressured to "look right." Studies indicate that satisfaction with appearance is associated with reporting fewer sexual problems, particularly less likelihood of experiencing issues related to lack of pleasure, arousal, and orgasm [68], which may explain why a more attractive appearance is linked to a greater willingness to engage in sexual activity. The strong association between girls' first sexual intercourse and their appearance may be related to objectification, which occurs in social and cultural contexts and through potential romantic and sexual partners. Sexual images of women and girls are prevalent in mainstream media and are linked to sexual behaviour outcomes [40].

Strengths and Limitations

Our analysis has utilised a distinctive approach to understanding the factors influencing the age of sexual initiation among Polish adolescents, employing a large sample and time failure models. A key advantage of this approach is its focus on the determinants of the age of initiation rather than just the occurrence of initiation or early initiation, distinguishing Cox models from traditional logistic regression.

In determining the validity of this method, we drew upon the findings of other studies [39]. Nevertheless, some authors [69] put forth more sophisticated accelerated failure-time models. The data available and the method used for the time-to-failure model permitted the exact age of the respondents to be taken into account, which is important given the age range of the qualified students. It was possible to accurately determine the age of the adolescent at the time of the incident, although another limitation is the approximate age at which it occurred. As previously stated in the introduction, the advantage of our study using methods typical of censored data is the observation of adolescents at a time when they often choose to engage in sexual contact. However, this is not a complete observation, and the relatively low percentage after initiation made median estimation impossible.

Another significant limitation is the reliance on self-reported data and the cross-sectional nature of the study, which limits causal inference. Efforts were made to minimise bias, such as asking about experience with substance use over the respondents' lifetime, rather than just over the past 30 days.

Possible reverse causality is also a consideration that must be kept in mind for many factors. Satisfying romantic relationships and positive first sexual experiences might improve self-esteem, promote healthy behaviours, and enhance peer group functioning. There may be concerns about the set of factors influencing the age of sexual initiation, but estimating the combined impact of 17 factors distinguishes this study from others. One important additional factor to consider including in future analyses is the pubertal timing.

Our use of data from 2018 may also be seen as a limitation. Although the data are relatively older, the use of these data for the present study nevertheless have some justifications: later HBSC studies (2022 in Poland) were conducted during the COVID-19 pandemic, which disrupted social relationships. Additionally, the Polish questionnaire changed significantly, making it impossible to repeat identical analyses with newer data. Adolescents may also feel discomfort about their first sexual experience, especially if it was influenced by partner or social pressure or sexual arousal.

Our study is limited in that it does not consider respondents' subjective perception of the timing of their first sexual intercourse. Given that feeling that one's sexual initiation occurred too early or too late can have psychological consequences [70], future research should take this into consideration, as in studies like Rouche et al. [71].

Lastly, there has been a significant shift in the way media are used, which has, in turn, altered the methods for measuring media engagement. Future research should incorporate media usage within models, taking into account the fact that young people internalise views on sexuality as a result of their media consumption [72].

5. Conclusions

Recognising sexual debut as a natural aspect of adolescent development is crucial for understanding this stage as a part of normal maturation. However, it is imperative to acknowledge the diverse factors influencing the age of sexual initiation, including social, emotional, educational, and familial influences. Analysing these factors is essential for developing effective interventions and educational strategies aimed at promoting healthy sexual development and reducing potential negative consequences associated with early sexual debut. Moreover, in the comprehensive model, when the entire population was examined, gender was not a significant factor. However, the most notable outcome is that the predictors vary between boys and girls. The factors influencing performance in boys differ from those affecting performance in girls. These findings remain pivotal because they indicate that distinct strategies may be necessary to support boys and girls in tailored sex education.

Our study highlights that frequent use of psychoactive substances strongly predicts earlier sexual initiation, with even moderate use exerting an impact. While gender did not directly influence the age of initiation, our findings indicate that boys are more likely to initiate earlier if they are highly physically active and spend considerable time with peers. Conversely, for girls, a positive self-assessment of their appearance tends to correlate with earlier initiation, whereas good academic performance and strong family support tend to delay their decision to engage in sexual activity.

Educational efforts should prioritise ensuring that adolescents have positive, enjoyable, and respectful first sexual experiences, alongside a thorough understanding of consent. Encouraging self-esteem, fostering emotional connections, and promoting open communication with both parents and partners are essential components of effective sexual education programs [73]. These programs should be inclusive and tailored to the diverse experiences and identities of young people, aiming to empower them to make informed and responsible decisions about their sexual health and relationships.

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