

# Prevalence and Trends in the Utilization of Gynecological Services by Adolescent Girls in Germany. Results of the German Health Survey for Children and Adolescents (KiGGS)

## Häufigkeiten und Trends in der Inanspruchnahme von niedergelassenen Ärztinnen und Ärzten für Frauenheilkunde durch Mädchen in Deutschland. Ergebnisse der Studie zur Gesundheit von Kindern und Jugendlichen in Deutschland (KiGGS)

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### Schlüsselwörter

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### ABSTRACT

There is only limited data available on the utilization of gynecological services in Germany. Based on data from the German Health Survey for Children and Adolescents (KiGGS) of the Robert Koch Institute, a survey carried out across all of Germany, this study aimed to examine the utilization of gynecological services by girls in Germany. Data from the KiGGS

Wave 1 survey (2009–2012) was used to analyze the factors which affect utilization. The KiGGS baseline study (2003–2006) was used to analyze trends. The database consisted of a subsample from the KiGGS Wave 1 survey ( $n = 2575$ ), the initial follow-up survey conducted by telephone after the baseline study. Data are shown as prevalence and mean with 95% confidence intervals. Correlations with selected influencing factors were calculated using multivariate logistic regression models. Differences between study populations were considered significant if  $p < 0.05$ . At the time of the KiGGS Wave 1 survey, 53.9% of girls aged 14 to 17 years had visited a gynecologist at least once. This percentage increased significantly with each additional year of life. For 61.9% of 17-year-old girls who had previously visited a gynecologist at least once, the first visit to a gynecologist occurred at the age of 15 or 16 years. Growing up with siblings was associated with a lower prevalence of utilization, while middle socioeconomic status, risky alcohol consumption and daily consumption of tobacco, and the utilization of general medical services were associated with a higher 12-month prevalence for the utilization of gynecological services. The utilization of gynecological services has increased significantly compared to the KiGGS baseline survey. Among girls there is a high need for information on issues of sexual health. Gynecologists are important but they are not the only port of call. Information needs should be covered as part of a coordinated approach which includes the involvement of all relevant stakeholders. Initiatives such as the WHO Action Plan for Sexual and Reproductive Health and its recommendations should be incorporated.

### ZUSAMMENFASSUNG

In Deutschland sind nur wenige Daten zur Nutzung frauenärztlicher Leistungen verfügbar. Basierend auf Daten der bundesweiten „Studie zur Gesundheit von Kindern und Jugendlichen

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in Deutschland“ (KiGGS) des Robert Koch-Instituts wird die Inanspruchnahme von Frauenärztinnen und Frauenärzten durch Mädchen untersucht. Anhand der Daten aus KiGGS Welle 1 (2009–2012) wird analysiert, welche Faktoren die Nutzung beeinflussen. Für Trendanalysen wird die KiGGS-Basiserhebung (2003–2006) herangezogen. Datenbasis ist eine Teilstichprobe aus KiGGS Welle 1 (n = 2575), der ersten telefonischen Folgebefragung nach der Basiserhebung. Berichtet werden Prävalenzen und Mittelwerte mit 95 %-Konfidenzintervallen. Zusammenhänge mit ausgewählten Einflussfaktoren wurden mit multivariaten logistischen Regressionsmodellen berechnet. Unterschiede zwischen den Studienpopulationen werden bei  $p < 0,05$  als signifikant ausgewiesen. Zum Befragungszeitpunkt von KiGGS Welle 1 haben 53,9% der 14- bis 17-jährigen Mädchen mindestens einmal frauenärztliche Leistungen in Anspruch genommen. Dieser Anteil nimmt mit jedem Lebensjahr deutlich zu. Bei 61,9% der 17-jährigen Mädchen, die bereits

eine gynäkologische Praxis besucht haben, fand der erste Kontakt mit 15 oder 16 Jahren statt. Das Aufwachsen mit Geschwistern geht mit einer geringeren, ein mittlerer sozioökonomischer Status, ein riskanter Alkohol- und täglicher Tabakkonsum sowie die Inanspruchnahme allgemeinärztlicher Leistungen mit einer höheren 12-Monats-Prävalenz der Inanspruchnahme einher. Im Vergleich zur KiGGS-Basiserhebung hat die Inanspruchnahme deutlich zugenommen. Bei Mädchen besteht ein großer Bedarf an Informationen zu Fragen der sexuellen Gesundheit. Frauenärztinnen und Frauenärzte sind dabei wichtige, aber nicht die einzigen Anlaufstellen. Der Informationsbedarf sollte evidenzbasiert im Rahmen eines abgestimmten Vorgehens unter Beteiligung der relevanten Akteure gedeckt werden. Dabei sollten Initiativen wie der WHO Action Plan for Sexual and Reproductive Health und dessen Empfehlungen berücksichtigt werden.

## Introduction

Adolescence is a stage when many physical and mental changes occur. These changes constitute developmental challenges for adolescents as they transition from childhood to adulthood [1]. One of the tasks during this time of transition is to integrate the physical changes into the adolescent's own self-image and self-development and create a basis for a healthy sexuality and confident, well-informed sexual relationships [2].

Because adolescence has specific health-related needs, the World Health Organization (WHO) has urged that adolescents should have universal access to healthcare and counseling services specially tailored to adolescent needs [3]. During the consultations on a future action plan for sexual and reproductive health, the WHO has demanded that counseling and preventive healthcare services be expanded, with a particular focus on reproductive and sexual health (see infobox for definitions) [4]. Adolescents should be informed in good time about the expected physical and mental changes; this information can also help to prevent undesirable events such as unwanted pregnancies or sexually transmitted diseases [5–7].

In Germany's medical system, healthcare services and counseling services on issues of reproductive health are, in principle, guaranteed though the universal access to healthcare services. The important question is therefore primarily whether existing offers are sufficiently taken up by the target audience. The literature has addressed the negative consequences of underprovision [2], but it has also been noted that oversupply – understood here as the medicalization of physiological processes – can also have negative consequences [8]. In Germany, recommendations about the right time for the first visit to a gynecologist and the appropriate interval between gynecological visits are primarily issued by professional associations and societies [9, 10]. According to their recommendations, girls should visit a gynecologist when they need advice or need to be checked for disease or a disorder (e.g. amenorrhea) [9, 10]. A gynecological check-up every half year is recommended for girls who take contraceptive pills after their initial ex-

### INFOBOX: DEFINITIONS

#### **Sexual and reproductive health (WHO Regional Office for Europe 2011) [50]**

Sexual health is an integral part of overall health, well-being and quality of life.

It is a state of physical, emotional, mental and social well-being in relation to sexuality, and not merely the absence of disease, dysfunction or infirmity.

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 of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all people must be respected, protected and fulfilled.

#### **Reproductive health and reproductive rights (International Conference on Population and Development 1994) [51]\***

Reproductive health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and to its functions and processes. Reproductive health therefore implies that people are able to have a satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so. Implicit in this last condition are the right of men and women to be informed and to have access to safe, effective, affordable and acceptable methods of family planning of their choice, as well as other methods of their choice for the regulation of fertility which are not against the law, and the right of access to appropriate healthcare services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant.

\* German translation: [52]

amination, and girls should also receive detailed information when they are first prescribed the pill [11].

The recommendations in the USA go a lot further, with proposals that reproductive health services should be used much earlier, and that the first visit should be followed by regular visits. The American College of Obstetricians and Gynecologists (ACOG) recommends that the initial visit to a gynecologist should take place between 13 and 15 years, i.e., at a time when some girls have their first sexual experiences [12]. The importance of regular counseling and examinations is justified with reference to the changing needs of adolescence [6, 7, 13]. The National Academy of Medicine (previously: the Institute of Medicine, IOM) recommends that sexually active women of all ages should pay annual visits to a gynecologist and that these appointments should include information on sexually transmitted diseases [14].

Although currently no such recommendations exist for Germany, the codification of new entitlements to medical services in Volume V of the German Social Insurance Code (SGB V) and the subsequent recommendations of the Federal Joint Committee (G-BA) have created a new basis for gynecological counseling and preventive sexual healthcare. Puberty and sexual behavior have been part of the J1 (youth health prevention) examination offered to adolescents aged between 12 and 14 years since the J1 examination was first introduced in 1998 [15, 16]. Since 2008, sexually active women in Germany up to the age of 25 years are entitled to an annual chlamydia test [17]. The Standing Committee on Vaccination (STIKO) at the Robert Koch Institute additionally recommends the routine immunization against human papillomaviruses (HPV) before the first sexual intercourse, initially in 2007 for girls aged 12 to 17 years, and from 2014 for girls aged 9 to 14 years [18]. Pediatricians also offer a J2 examination for adolescents aged 16 to 17 years, but not all health insurance companies are prepared to underwrite the costs of this examination [19]. This final youth health prevention examination focuses on sexuality, social behavior and career choices [19].

To use these services would require children and adolescent girls to regularly visit physicians who offer these services. In addition to pediatricians, gynecologists in office-based practices can also play a key role, as there is often a relationship of trust between patient and gynecologist and, from the perspective of adolescent girls, gynecologists are a key source of information on sexual health [20, 21].

According to the study on adolescent sexuality carried out by the Federal Center for Health Education (BZgA), the primary reasons to first visit a gynecologist were questions on contraception and the prescription of contraceptives [21]. Just under half of women and girls aged between 14 years and 25 years were on the pill at the time of their first sexual intercourse. Menstrual problems and HPV immunization are additional reasons cited for visiting a gynecologist [21]. According to the findings of the health monitoring program of the Robert Koch Institute, 52.6% of adolescent girls aged 14 to 17 years have been vaccinated at least once against HPV; 39.5% have received the complete series of vaccinations. Girls who have visited a gynecologist at least once are twice as likely to be vaccinated against HPV [22].

The aim of this study was to determine the age at which adolescent girls in Germany first use gynecological services and how

often, on average, they visit a gynecologist. It is important to consider that the utilization of healthcare services does not only depend on medical needs but is also contingent upon a number of social and personal factors [23, 24].

The utilization of gynecological services by adolescent girls was analyzed based on data from the German Health Survey for Children and Adolescents (KiGGS). The lifetime prevalence for the utilization of outpatient gynecological services and patient age at the initial visit to a gynecological practice are reported. These data are supplemented by information on the utilization of these services over the last 12 months and the frequency of contact. An additional chapter looks at the social, behavioral and healthcare-related factors which can influence the use of gynecological services. The study ends with a chronological comparison of data from the KiGGS baseline survey (2003–2006) with data from the first follow-up survey (KiGGS Wave 1, 2009–2012).

## Method

### Data

The results of the national KiGGS study carried out by the Robert Koch Institute were used to identify how girls in Germany utilize outpatient gynecological services.

The KiGGS study is part of the health monitoring program of the Robert Koch Institute and consists of a combined, national, cross-sectional and longitudinal study. The KiGGS baseline study (2003–2006) included surveys, investigations and laboratory reports [25]; the first follow-up survey – the KiGGS Wave 1 survey (2009–2012) – consisted exclusively of interviews carried out by telephone [26]. A total of 17 641 children and adolescents (8656 girls, 8985 boys) aged 0 to 17 years were included in the KiGGS baseline study; the response rate was 66.6%. The children and adolescents invited to participate in the study were determined by stratified sampling at 167 locations in Germany; their names were then randomly picked from the respective local registers of residents [25]. The sample for the KiGGS Wave 1 survey included a new cross-sectional sample of children aged 0 to 6 years, who were also randomly picked from the registers of residents of the original 167 locations of the study. Participants in the previous KiGGS baseline study, now aged between 6 and 24 years and continued in the form of a closed cohort, were also invited to participate in the follow-up survey. A total of 12 368 children and adolescents (6093 girls, 6275 boys) in the relevant age range between 0 and 17 years participated in the KiGGS Wave 1 survey, of whom 4455 were invited to participate for the first time (response rate: 38.8%) while 7913 had already participated in the previous study (response rate: 72.9%) [26].

### Variables

The use of gynecological services was evaluated separately for 11 to 17-year-old girls according to years of life and age group. The two age groups – 11 to 13 years and 14 to 17 years – mirror the developmental stages of childhood and adolescence, with the first stage corresponding approximately to the transition from childhood to adolescence (transescence) and the second stage corresponding to adolescence [27].

In the KiGGS Wave 1 survey, girls in the group aged 14 to 17 years were asked directly: “Have you ever visited a gynecologist?”, “And how often have you visited a gynecologist in the last 12 months?”. They were additionally asked “How old were you when you first visited a gynecologist?”. When the parents of the girls aged 7 to 13 years were interviewed, they were asked: “Has your child visited a gynecologist in the last 12 months?”, “And how often did your child visit a gynecologist in the last 12 months?”.

To measure medical need, the 11 to 17-year-old girls were asked for a subjective evaluation of their own general state of health using a question from the Minimum European Health Module (MEHM): “How is your health in general?”. The pre-set responses were grouped into the categories “very good/good” and “fair/poor/very poor” [28]. Repeated menstrual pain in the last three months was investigated for this group of 11 to 17-year-old girls as a specific medical indicator for the utilization of gynecological services using the question: “Did you experience the following type of pain in the last 3 months?” [29]. Girls were also offered the option to choose menstrual pain as the site of pain. They were given a three-level rating scale which was dichotomized for statistical evaluation into “yes, repeatedly” vs. “yes, once/no”.

In addition to medical need, earlier studies primarily identified socio-demographic and familial factors as variables which influenced the utilization of medical services in childhood and adolescence [24, 30, 31]. In addition to age, sociodemographic factors also included socioeconomic status (SES) and immigrant background. The KiGGS Wave 1 survey determined participants’ SES based on parental information about schooling and vocational training, occupational status and their net (needs-adjusted) household income, and subsequently divided participants into low, middle and high socioeconomic status groups. Children and adolescents were assigned the SES of the household in which they were living [28]. Surveyed children and adolescents were defined as having a bilateral immigrant background if they had migrated to Germany from another country and had at least one parent who was not born in Germany, or if both parents had migrated to Germany or did not have German nationality [32].

Another familial variable included in the study was whether additional siblings were living in the household. Parents of all girls were asked the following question: “Does your child have siblings? This also includes half-siblings.” (Possible responses: “yes”, “no” and “don’t know”). The type of family constellation, based on information provided by the parents about the main place of residence, was also included in the analysis. The survey differentiated between one-parent families where the children grow up in a household with only one parent present (referred to below as single parents), nuclear and step families, where two natural or social parents live together [31]. Family relations were also investigated for adolescents aged 11 years and over, using the question “We all get on really well with each other” from the family climate scale developed by Schneewind et al. [33]. The range of potential responses were summarized into the three ratings “agree strongly”, “agree somewhat” and “disagree somewhat or strongly” [34].

The study also investigated whether utilization of gynecological services was associated with behavioral factors. To assess this, the study looked at indicators assumed in the available literature to affect the utilization of medical services [35]. The internationally es-

tablished AUDIT-C test (Alcohol Use Disorders Identification Test), which consists of three questions, was used to assess risky alcohol consumption [36]. Originally designed as a means of screening adult populations, the AUDIT-C test has also been found to be useful to screen adolescents [37]. Smoking behavior was assessed in the KiGGS Wave 1 survey with the help of several questions [37]. To differentiate between groups with comparatively high rates of tobacco use, girls who smoked every day were distinguished from non-smokers and girls who did not smoke every day.

The utilization of other medical services in the last 12 months (i.e., visits to a pediatrician or a general practitioner) was considered to be a healthcare-related factor which influenced the utilization of gynecological services, as general practitioners can recommend or arrange for gynecological counseling or treatment as part of their mandate to offer basic care to their patients [38, 39]. The interviews with the parents of girls aged between 7 years and 13 years also included the question: “Did your child visit a general practitioner or pediatrician in the last 12 months?”; girls aged 14 years to 17 years were asked directly: “Have you visited a general practitioner or pediatrician?”.

## Statistical analysis

The KiGGS Wave 1 analyses focus on girls aged between 14 years and 17 years, as younger girls very rarely utilize gynecological services. When data are also available for younger girls, this is explicitly referred to in the text.

The study calculated the percentage of girls between the age of 14 years and 17 years who had visited a gynecologist at least once. It also calculated the age when 17-year-old girls first visited a gynecologist. The percentage of girls aged between 11 years and 17 years who used gynecological services in the last 12 months is shown, and the arithmetic mean for the frequency of contact in the last 12 months is calculated. This is followed by a correlation analysis for girls between 14 and 17 years between the 12-month prevalence for the utilization of gynecological services and factors which potentially influence the utilization of services. Finally trend comparisons of the 12-month prevalence and the frequency of contact were done for girls aged between 14 years and 17 years by cross-sectional analysis of the samples from the two surveys carried out at different time points, the KiGGS baseline survey (2003–2006) and the KiGGS Wave 1 survey (2009–2012).

Prevalence and mean value were weighted as percentages with 95% confidence intervals (95% CI) and reported with reference to the total number of all girls who gave valid answers. Correlations between the 12-month prevalence for the utilization of gynecological services and selected influencing factors were calculated using multivariate logistic regression models, and the results presented as odds ratios. Differences in the 12-month prevalence for the utilization of gynecological services and the frequency of contact between the study population of the KiGGS baseline survey (2003–2006) and the population of the KiGGS Wave 1 survey (2009–2012) were tested for statistical significance using Rao-Scott correction of the Chi-square test and F-distribution. Differences were considered statistically significant for  $p$ -values  $< 0.05$ .

Analysis of complex samples was done using the StataSE 14 software. All analyses used a weighting factor to correct for devia-

► **Table 1** Sample description of KiGGS Wave 1 regarding girls in Germany aged 11 to 17 years; number and percentage of the sample (%) (n = 2575).

	Number	Percentage (%)	
	un-weighted	weighted	95% CI
Age groups			
▪ 11–13 years	1097	42.7	40.6–44.8
▪ 14–17 years	1478	57.3	55.2–59.4
Socioeconomic status			
▪ low	297	21.2	18.4–24.3
▪ middle	1650	61.6	58.6–64.5
▪ high	594	17.1	15.2–19.3
▪ missing	34	–	–
Immigrant background			
▪ immigrant background	262	18.1	15.3–21.3
▪ no immigrant background	2313	81.9	78.7–84.7
▪ missing	0	–	–
Siblings			
▪ yes	2235	89.1	87.4–90.6
▪ no	304	10.9	9.4–12.6
▪ missing	36	–	–

tions of the sample from the population structure (as at December 31, 2010) with regard to age, gender, region, nationality, type of community and education of the head of the household (micro-census 2009). With regard to former participants in the KiGGS baseline survey, the difference in the willingness to participate in a survey again were offset by weighting for relevant characteristics in the baseline survey. To calculate trends, data from the baseline survey were newly weighted according to the characteristics mentioned above and standardized for age according to the population status in Germany on December 31, 2010.

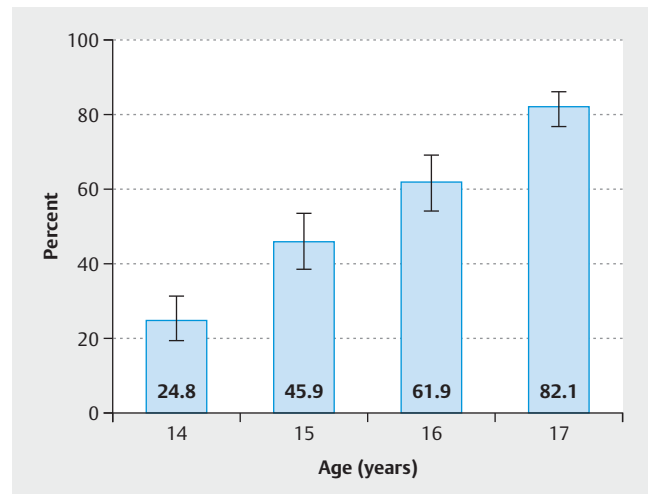
## Results

### Sample composition

Statistical analysis was based on the data of 2575 girls aged from 11 years to 17 years and resident in Germany. Some of the key characteristics of the KiGGS Wave 1 sample used here are shown in ► **Table 1**.

### First utilization of gynecological services

53.9% (95% CI: 50.3–57.4) of girls aged between 14 years and 17 years living in Germany had visited a gynecologist at least once. The percentage of girls who visited a gynecologist at least once (lifetime prevalence), increased significantly with every additional year of life for girls between 14 and 17 years (► **Fig. 1**). While around one quarter (24.8%; 95% CI: 19.2–31.3) of girls aged 14 had visited a gynecologist, this figure increased to almost one half (45.9%; 95% CI: 38.5–53.6) for girls aged 15 years, rising to almost two thirds (61.9%; 95% CI: 54.2–69.1) of girls aged 16 years.



► **Fig. 1** Lifetime prevalence for the utilization of gynecological services for girls aged 14 to 17 years according to age in % (n = 1395). Source: KiGGS Wave 1 (2009–2012).

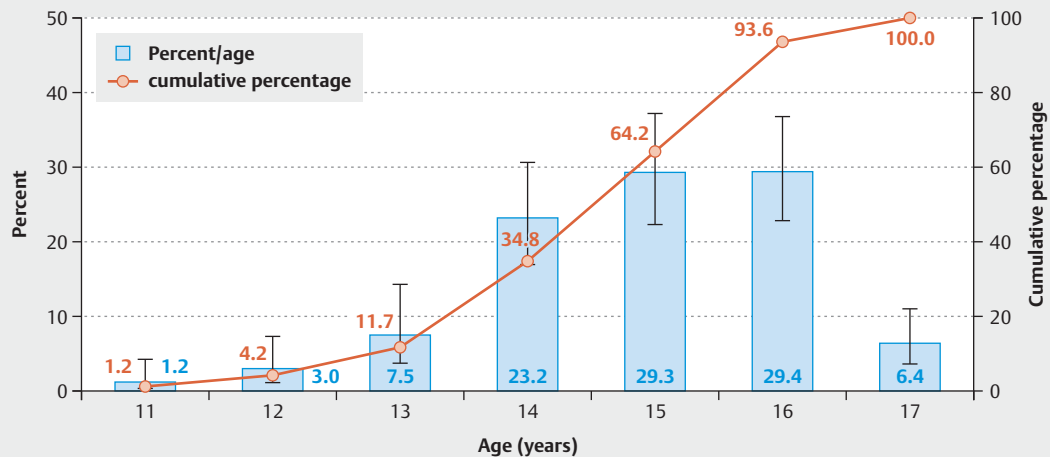
While the overwhelming majority of girls aged 17 years utilized gynecological services at some point, 17.9% (95% CI: 13.7–23.1) had never yet visited a gynecologist.

Of the 82.1% (95% CI: 76.9–86.3) girls aged 17 years who had visited a gynecologist at least once previously at the time of the survey, 11.7% had visited a gynecologist at the age of 13 years or younger. By the age of 15 years, 64.2% of these girls had visited a gynecologist, and by the age of 16 years 93.6% of these girls had visited a gynecologist at least once (► **Fig. 2**, cumulative percentage). The first visit to a gynecologist usually occurred at the age of 15 or 16 years. Just under 30% of girls aged 17 years who visited a gynecologist had their first gynecological treatment or counseling at the age of 17 years (► **Fig. 2**, percentage/years of age).

### 12-month prevalence for utilization and frequency of contact

Around half (45.8%; 95% CI: 42.2–49.4) of the girls aged between 14 years and 17 years had visited a gynecologist in the last twelve months (results not shown). For the girls aged between 11 years and 13 years, this figure was 7.1% (95% CI: 4.7–10.4), while the figure for girls aged between 7 years and 10 years was just 1.0% (95% CI: 0.5–2.2). The 12-month prevalence for utilization, i.e. the percentage of girls who had visited a gynecologist in the last twelve months, increased significantly with every additional year of life. While the figure for 12-year-old girls was 4.7% (95% CI: 2.3–9.4), it rose to 20.0% (95% CI: 15.1–26.1) for 14-year-old girls and increased to 38.7% (95% CI: 31.8–46.2) for 15-year-old girls. In the group of girls aged 16 years, 52.9% (95% CI: 45.8–59.9) had visited a gynecologist in the last 12 months, and in the group of girls aged 17 years almost three quarters (71.1%; 95% CI: 64.4–77.0) of the surveyed girls had visited a gynecologist sometime in the last 12 months.

As with the 12-month prevalence, the frequency of visits to a gynecologist over a period of one year also increased with age. On average, girls aged between 11 and 13 years visited a gynecologist



► **Fig. 2** Age at first visit to a gynecologist for girls aged 17 years; percentage and cumulative percentage (n = 276). Source: KiGGS Wave 1 (2009–2012).

colologist 1.7 times (95% CI: 1.3–2.1) in the space of the previous 12 months, while girls aged 14 to 17 years paid 2.3 visits (95% CI: 2.1–2.6) to a gynecologist over the same period (results not shown). The highest contact frequency was reported for girls aged 16 years, with 2.6 (95% CI: 2.1–3.2) visits in the previous 12 months.

### Social, behavioral and healthcare-specific factors

Investigated social factors which could affect the 12-month prevalence for the use of gynecological services included socioeconomic status (SES), immigration status, type of family, growing up with siblings, and closeness of family relations (► **Table 2**). The results showed that girls aged between 14 years and 17 years from families with a middle SES visited a gynecologist significantly more often than girls of the same age from families with a high SES. Girls with siblings visited a gynecologist significantly less often. A detailed evaluation of the existing data showed that this lower utilization of services occurred irrespective of the age and gender of the siblings living in the same household (results not shown). Behavioral factors which influenced the utilization rates included risky consumption of alcohol and smoking every day, both of which were associated with a significantly higher utilization of gynecological services. Girls who smoked every day were almost four times as likely to visit a gynecologist compared to girls who did not smoke every day. As regards healthcare-related factors, analysis showed that the 12-month prevalence for the utilization of gynecological services correlated significantly with the utilization of general medical services over the previous 12 months. However, there was no correlation with the utilization of pediatric medical services in the last 12 months (results not shown).

### Comparison of rates of utilization over time

The utilization of gynecological services over a period of 12 months by girls aged between 14 years and 17 years increased significantly between the time of the KiGGS baseline survey (2003–

2006) and the KiGGS Wave 1 survey (2009–2012) (► **Table 3**). When the results were stratified according to SES it was found that this increase only occurred for girls from families with a low or middle socioeconomic status. In addition to the higher rates of utilization, the frequency of visits to a gynecologist over a period of 12 months by girls aged between 14 years and 17 years also increased significantly over the surveyed period of approximately six years. When these findings were differentiated according to SES, the increase was predominantly among girls with a middle SES.

### Discussion

At the time of the KiGGS Wave 1 survey, around 54% of girls aged between 14 years and 17 years living in Germany had visited a gynecologist at least once. This percentage increased significantly with every additional year of life. Around one in five girls aged 17 years had never visited a gynecologist. For almost two thirds of girls aged 17 years who had visited a gynecologist, the first visit to a gynecologist occurred when the girl was 15 or 16 years old. Only older adolescent girls tended to visit a gynecologist regularly: around half of girls aged 16 years and almost three quarters of girls aged 17 years who had visited a gynecologist at least once reported that they had visited a gynecologist in the previous twelve months. When the impact of social factors was studied, analysis showed that growing up with siblings was associated with a significantly lower 12-month prevalence for the utilization of gynecological services. With regard to behavioral factors, risky consumption of alcohol and smoking every day were associated with a higher utilization of gynecological services. Moreover, the 12-month prevalence for the utilization of gynecological services correlated significantly with the utilization of general medical services. Compared to the KiGGS baseline survey (2003–2006), the utilization of gynecological services was significantly higher in the KiGGS Wave 1 survey (2009–2012). This was particularly evident for girls from families with a low or middle socioeconomic status.

► **Table 2** Determinants of the 12-month prevalence for the utilization of gynecological services by girls aged 14 to 17 years; prevalence (%) and results of multivariate binary logistic regression (odds ratios) (n = 1389). Data: KiGGS Wave 1 (2009–2012).

	% (95% CI)	OR (95% CI)	p
Socioeconomic status			
▪ low	42.3 (32.7–52.4)	1.50 (0.85–2.64)	0.160
▪ middle	50.8 (46.0–55.5)	1.88 (1.23–2.89)	0.004
▪ high	35.2 (29.2–41.7)	ref.	
Immigrant background			
▪ immigrant background	30.5 (22.0–40.6)	0.62 (0.34–1.15)	0.128
▪ no immigrant background	49.1 (45.3–52.9)	ref.	
Single parent household			
▪ yes	51.1 (42.2–60.6)	0.99 (0.62–1.57)	0.963
▪ no	45.3 (41.4–49.3)	ref.	
Siblings living in the same household			
▪ yes	44.7 (41.0–48.4)	0.52 (0.31–0.86)	0.011
▪ no	59.9 (49.0–69.9)	ref.	
Close family relationship			
▪ strongly disagree/disagree	55.9 (43.1–67.9)	1.37 (0.68–2.78)	0.378
▪ agree	47.5 (42.1–53.1)	1.18 (0.83–1.68)	0.353
▪ strongly agree	42.2 (37.5–47.4)	ref.	
Risky consumption of alcohol			
▪ yes	67.6 (60.6–73.9)	1.58 (1.04–2.41)	0.034
▪ no	37.6 (33.6–41.7)	ref.	
Smokes every day			
▪ yes	83.1 (72.5–90.2)	3.67 (1.79–7.50)	0.000
▪ no	42.2 (38.8–45.8)	ref.	
Visited a GP in the last 12 months			
▪ yes	56.0 (51.1–60.7)	2.11 (1.51–2.96)	0.000
▪ no	31.6 (26.2–37.5)	ref.	

OR: odds ratio; OR adjusted for age, self-rated health and menstrual pain.

Certain limitations need to be considered when interpreting these results. It is important to note that information reported by a respondent or her parents is subject to a certain amount of recall bias. This recall bias was reduced by asking girls aged between 14 years and 17 years directly about their utilization behavior. Studies have shown that parents tend to underestimate the extent of utilization of medical services by adolescents, particularly when the utilized medical services involved confidential counseling [40]. Recall bias is also expected if the period under investigation is longer than the past 12 months [41]. When considering the lifetime prevalence for the utilization of gynecological services it is assumed that there are no memory gaps because the focus is not on a specific period and no questions are asked about the number of contacts. When analyzing trends it is important to note that the KiGGS baseline survey (2003–2006) used a written questionnaire, while the KiGGS Wave 1 survey (2009–2012) was done by telephone interviews. However, studies on the use of different survey modes in healthcare surveys found no mode effects for indicators about the use of health services [42]. This is borne out by the finding in our study that utilization of

healthcare services did not increase for all types of medical services between the first two KiGGS surveys [31]. In principle, it is difficult to differentiate clearly between cause and effect when carrying out correlation analysis based on cross-sectional data, as all data are collected at a single point in time. However, it is possible to widely exclude reciprocal effects between certain variables and the use of gynecological services, as it is implausible that certain determinants are itself affected by the use of gynecological services, for example SES. The only exception to this is the interdependency between using general medical services and the utilization of gynecological services. This suggests that the other determinants have a significant effect on the use of gynecological services. In future studies, data from the KiGGS Wave 2 survey will offer the opportunity to evaluate these findings using longitudinal analysis.

Overall, the findings accorded well with the current knowledge on the use of healthcare services. Studies on adolescent sexuality carried out by the Federal Center for Health Education (BZgA) reported similar lifetime prevalences for the utilization of gynecological services by girls aged 14 years to 17 years, and confirmed

► **Table 3** Trends for the utilization of gynecological services in the last 12 months by girls aged 14 to 17 years. Prevalence (%) and frequency of contact (arithmetic mean). Data: KiGGS baseline survey (2003–2006), KiGGS Wave 1 (2009–2012).

Indicator		KiGGS baseline survey <sup>1</sup>	KiGGS Wave 1	
		% (95% CI)	% (95% CI)	p <sup>2,3</sup>
N		1808	1389	
Prevalence	total	37.2 (34.6–39.9)	45.8 (42.2–49.4)	0.000
	low SES	28.6 (22.2–35.9)	42.3 (32.7–52.4)	0.019
	middle SES	39.8 (36.4–43.3)	50.8 (46.0–55.5)	0.000
	high SES	37.8 (32.4–43.6)	35.2 (29.2–41.7)	0.540
		AM (95% CI)	AM (95% CI)	p <sup>4</sup>
Contact frequency	total	2.0 (1.8–2.1)	2.3 (2.1–2.6)	0.006
	low SES	2.4 (1.8–3.0)	2.7 (2.1–3.4)	0.492
	middle SES	1.9 (1.8–2.1)	2.2 (2.0–2.5)	0.021
	high SES	1.8 (1.6–2.0)	2.1 (1.6–2.6)	0.241

<sup>1</sup> Age-adjusted for the population status on December 31, 2010.

<sup>2</sup> The significance test refers to comparisons of age-adjusted prevalences of the KiGGS baseline survey with those of the KiGGS Wave 1 survey.

<sup>3</sup> Chi-square test with 2nd order Rao-Scott correction

<sup>4</sup> Generalised linear model

SES: socioeconomic status; AM: arithmetic mean

that the first visit to a gynecologist generally takes place between 14 and 17 years [20, 21]. The higher percentage for the lifetime prevalence for 17-year-old girls reported in the BZgA studies compared to the data from the KiGGS Wave 1 survey could be explained by the fact that the KiGGS survey only used data obtained from girls up to the age of 17 years. Data for girls aged 17 years who first visited a gynecologist after the survey but before they reached the age of 18 were not included.

According to the findings of our study, the use of gynecological services is influenced by a number of factors such as SES. At the time of the survey the middle socioeconomic status group had the highest rates of use of gynecological services in the last 12 months. Based on the evaluation of data from the KiGGS Wave 1 survey, this also applies to the use of general medical services. No differences in SES were found for the 12-month prevalence for the utilization of pediatric services [31]. The effect of SES on the use of medical services in childhood and adolescence depicted across a range of studies is inconsistent [30, 31, 43].

Growing up with other siblings in the household was another factor which influenced the use of gynecological services. Growing up with sisters could be particularly relevant: data from the BZgA showed that in matters of sex education girls between 14 and 17 years were strongly influenced by persons of the same gender such as their sisters [21]. However, the KiGGS data show that utilization of gynecological services in households with other siblings was lower irrespective of the age and gender of the siblings, a finding that suggests that the effect could be due to the family constellation: siblings can serve as someone to talk to before contacting medical services. This explanation would correspond to the report of the BZgA which noted that nowadays adolescents are able to discuss sexual issues openly within their family [21]. Another explanation for the lower rates of utilization among children who grow up with siblings is based on the fact that

parents significantly determine how their children use medical services. Children of smaller families were found to use pediatric services more often [24]. The explanation given for this is that parents of smaller families focus more on their children's health issues and have more time to visit a doctor. Conversely, the parents of larger families have more experience of dealing with their children's medical ailments without needing to contact the medical healthcare services [24]. This parental behavior can probably – particularly with respect to younger girls – be transferred to the utilization of gynecological services.

Smoking every day and risky alcohol consumption were also found to be relevant factors associated with higher utilization rates of gynecological services (cf. also [35]). Studies which have indicated a connection between sexual activity and substance use offer an explanation for this correlation: adolescents with early pubertal maturation were more likely to gather sexual experiences and also tended to be ahead of their age-matched peers in terms of (irregular) consumption of tobacco and alcohol [44–46]. Regular and risky use of substances is also associated with risky sexual behaviors [47]. According to data from the BZgA, girls are particularly likely to visit a gynecologist when they begin to be sexually active and need information and counseling [21].

The KiGGS studies also showed increasing rates for the utilization of pediatric services over time but no increase in the use of general medical services. The increase in the use of pediatric services was considered to be due to the expansion of the range of early screening examinations for children and adolescents (U1–U9, J1, and J2 check-ups) and the introduction of new vaccines [31]. These factors could also affect the increased utilization of gynecological services. HPV vaccination programs and chlamydia screening were introduced in the period between the first two KiGGS surveys. HPV vaccination was initially recommended for girls aged between 12 years and 17 years. According to informa-



tion from BZgA studies it provided a relevant reason to visit a gynecologist [21]. In the KiGGS study the girls were not asked about their reason for visiting a gynecologist; however, analysis has shown that HPV vaccination rates were significantly higher among girls who had visited a gynecologist at least once compared to girls who had never visited a gynecologist [22]. Overall a diversification in the utilization of different medical services has been noted [31]. The relocation of pediatric and general medical services to other medical specialist services could also be contributing to the higher utilization of gynecological services.

Additionally, long-term trends have shown a change in age at menarche, with menarche occurring at an earlier age [21]. As menstrual problems are a common reason for visiting a gynecologist [21], it is obvious that earlier age at menarche leads to earlier age at the first visit to a gynecologist and more frequent subsequent visits and therefore an overall increase in the utilization of gynecological services. As the age at menarche decreases, the age at which girls first have intercourse also decreases [21]. This results in a need for contraception counseling and the wish to be prescribed contraceptives at an earlier age [21].

In general, adolescents' need for information on sexual and reproductive health increases with age. There is also an increased need for information on medical procedures such as HPV vaccination or chlamydia screening, which have recently been included in the list of medical procedures covered by German health insurance companies. For adolescents to develop their own self-determined sexuality, it is important to satisfy their need for information through concerted action. Gynecologists are important contacts but are not the only port of call [21, 48]. Girls often ask their parents and siblings for advice, but they also turn to their friends, school or other institutions for advice before they use medical services. It is therefore difficult to measure whether the level of utilization of gynecological services by girls in Germany is appropriate. The increasing utilization of gynecological services in recent years shows the increasingly important role played by gynecologists. What is even more important is that the relevant information provided is evidence-based and is available according to the requirements of its target audience. As pointed out in the WHO Action Plan for Sexual and Reproductive Health [4] which is still under consideration, a concerted approach is necessary. The WHO recommends evaluating existing concepts for communicating information on sexual and reproductive health and revising them where necessary. The aim must be to encourage a coordinated approach to inform parents and children. Important stakeholders such as schools and healthcare professionals need to cooperate closely and find a suitable way of addressing their target audiences which would also allow difficult-to-reach groups to be integrated better. A cooperation between important national stakeholders such as the BZgA, the G-BA, health insurance companies, medical associations and professional societies would be useful. As the current preventive legislation in Germany focuses on regional aspects, it would make sense to develop concepts together with stakeholders such as schools, health departments and other local institutions, which could take the regional conditions into account, or to build on existing successful projects (for example, the *Ärztinnensprechstunde* project in Berlin [49]).

## Conflict of Interest

The authors declare that they have no conflict of interest.

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