

Original research article

# Use of contraception among women who request first trimester pregnancy termination in Norway

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## Abstract

**Objectives:** Among women requesting pregnancy termination, we studied the proportion of women who reported having used contraception when they became pregnant and the contraceptive method that they had used.

**Study design:** We included all requests for pregnancy termination in Norway during the years 2007–2011 ( $n=80,346$ ) by obtaining information from the Norwegian Registry of Pregnancy Termination. By using a logistic regression model, we estimated odds ratios for using any contraceptive method associated with the woman's age, previous childbirth, previous pregnancy termination, marital status, employment status and educational level.

**Results:** In total, 36.5% of the women who requested pregnancy termination (29,305/80,346) reported having used contraception when they became pregnant. Of all women, 16.6% reported having used the combined contraceptive pill/progestin pill, 11.5% the condom and 1.1% long-acting reversible contraceptives (1.0% intrauterine contraception). Overall, 38.9% of women 20–24 years old had used contraception, compared to 29.9% of women 40–44 years old (odds ratio 0.55, 95% confidence interval 0.51–0.60). Previous childbirth, previous pregnancy termination and high educational level were also associated with contraceptive use.

**Conclusion:** Among women who requested pregnancy termination in Norway, 36.5% reported having used contraception when they became pregnant. Contraception use was associated with young age and having previously been pregnant.

**Implications:** A large proportion of women who request pregnancy termination have experienced contraceptive failure. Women who are fertile and do not wish to become pregnant should be offered a contraceptive method that carries low risk of incorrect use.

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*Keywords:* Contraception; Pregnancy termination; First trimester; Risk factors

## 1. Introduction

In many western countries, about 20% of all first trimester pregnancies are terminated [1]. Unwanted pregnancy and pregnancy terminations are public health issues worldwide [2]. In Europe, the pregnancy termination rate varies between countries from 6 to 34 pregnancy terminations per 1000 women aged 15–44 years [3]. In Norway, the rate is 13 per 1000 women [4]. Easy access to contraception, particularly for young women, is considered to be an important strategy for prevention of unwanted pregnancies [5].

Contraceptives may fail due to user failure or due to method failure. If the majority of women, who experience contraceptive failure, do not want or find it impossible to have a child, it is likely that these women represent a large proportion of the women who request pregnancy termination.

Several studies have reported that up to two thirds of the women who request pregnancy termination had used contraception when they became pregnant, both in western and nonwestern countries [6–10]. Most previous studies are based on selected samples of women. Underreporting of pregnancy termination is widespread in countries where termination of pregnancy is illegal or the access is restricted [11]. We are not aware of any studies of the prevalence of contraceptive use among all the women in a country who request pregnancy termination.

Norway has national reporting of contraception use among women who request pregnancy termination. Based

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on this national reporting, we studied the proportion of women who reported having used contraception when they became pregnant. We also studied which contraceptive method they had used. In addition, we estimated the associations of age, previous childbirth, previous pregnancy termination, marital status, employment status and level of education with reported contraceptive use.

## 2. Material and method

Included in our study were all requests for pregnancy termination in the first trimester in Norway during the years 2007–2011. First trimester pregnancy terminations in Norway are performed on women's request. We used data from the Norwegian Registry of Pregnancy Termination, to which all requests for pregnancy termination are reported by law [12]. The requests for pregnancy termination are reported anonymously by a standardized patient record. The patient record is completed by the doctor who performs the clinical examination before the termination, typically 2–5 days before the termination [13]. The health institution, in which the termination is to be performed, is responsible for the reporting. In Norway, pregnancy termination is free of charge for the women, and the termination is performed or initiated in public health hospitals only.

The standardized patient record includes information from clinical interview, and we have used the following variables in our study; use of contraception, previous childbirth, previous pregnancy termination, marital status, employment status and education level. We also included region of residency in Norway as a potential confounding factor, since the pregnancy termination rates vary by region [4].

The different methods of contraception were reported to the Norwegian Registry of Pregnancy Termination as follows: no contraception, rhythm method, withdrawal, postcoital contraceptive, condom, combined contraceptive pill/progestin pill, estrogen–progestin patch, estrogen–progestin ring, injectable contraceptives, intrauterine contraception (with levonorgestrel), intrauterine contraception (without levonorgestrel), progestin subcutaneous implants, sterilization of the woman, sterilization of the male partner or other contraceptives. We grouped contraceptive methods as follows: (a) no contraception; (b) rhythm method including rhythm method, withdrawal and postcoital contraceptive; (c) condom; (d) short-acting hormonal contraception including combined contraceptive pill/progestin pill, estrogen–progestin patch or ring and injectable contraceptives (progestin); (e) long-acting reversible contraception (LARC) including intrauterine contraception (with or without levonorgestrel) and progestin subdermal implant; (f) sterilization (of the woman and/or partner); (g) other contraceptives; or (h) missing information. Use of any of the above contraceptive methods (b through g) was also grouped as use of contraception, and coded yes or no.

The woman's age was categorized as  $\leq 19$ , 20–24, 25–29, 30–34, 35–39, 40–44 or  $\geq 45$  years old. Number of

previous childbirths after pregnancy week 22 and number of previous pregnancy terminations were coded 0, 1 or  $\geq 2$ . Marital status was categorized as married/cohabiting, unmarried/single or divorced/widow. Employment status was categorized as paid employment, full time/part time, student without and student with paid employment or unemployed/receiving welfare benefits. *Educational level* was defined as the highest completed level of education: elementary school (9 years), high school (12–13 years) or college/university ( $> 13$  years). Region of residency in Norway was coded: East, Oslo (the capital), South, West, Central or North.

We calculated the proportion of women who reported having used any contraception and the proportions that had used the various contraceptive methods. Differences in proportions were tested by applying chi-square test. We also estimated crude and adjusted odds ratios (OR and aOR) with 95% confidence interval (CI) for use of any contraception according to woman's age and the study factors listed above by using logistic regression analyses. All statistical analyses were performed by using Statistical Package for the Social Sciences (SPSS) Version 21.0 or Windows (SPSS Inc., Chicago, IL, USA).

## 3. Results

The mean age of the women was 27.5 years [standard deviation (S.D.) = 7.1 years], and the median age was 26 years (range, 12–52 years) (Table 1). Women in the age group 20–24 years represented 28.3% of all requests for pregnancy termination, and women in the age group 25–29 years represented 22.2% of all requests.

In total, 36.5% of the women who requested pregnancy termination reported having used contraception when they became pregnant. Of all women, 11.5% reported condom use, 2.4% reported rhythm method use and 18.9% reported having used short-acting hormonal contraception. The most commonly used short-acting hormonal contraception was the combined contraceptive pill/progestin pill, which was reportedly used by 16.6% of all women. In total, 0.4% of the women reported having used injectable contraceptive (progestin). Only 1.1% of all women who requested pregnancy termination reported having used LARC (1.0% intrauterine contraception) (Table 2). Of the 219 women who reported use of sterilization as contraceptive method (0.3%

Table 1  
Demographic characteristics of the study population

Age in years, mean (S.D.)	27.5 (7.1)
Age in years, median (range)	26 (12–52)
Previous termination of pregnancy % (n)	36.7 (29,483)
Previous childbirth % (n)	48.3 (38,804)
Having paid income % (n)	53.0 (42,545)
Married or cohabiting % (n)	43.9 (35,300)

All women with request for pregnancy termination within the end of pregnancy week 12, in Norway during 2007–2011 (n=80,346).

of the requests), 34 women were sterilized, while 185 women had a partner who was sterilized.

The method of contraception, differed by women's age. Of women aged 20–24, 9.8% reported condom use, and of women aged 40–44 years, 14.1% reported the same ( $p < .001$ , chi-square test). Of women aged 20–24, 24.4% reported short-acting hormonal contraception use, and of women aged 40–44, 8.0% reported the same ( $p < .001$ , chi-square test). LARC was infrequently used by women in all age groups, particularly among the youngest. In total, 1.0% of the women reported having used intrauterine contraception, and 0.1% reported having used progestin implants (Table 2).

Overall, women in the youngest age groups reported having used contraception more frequently than older women. In total, 40.1% of women aged <19 years, 38.9% of women 20–24 years and 29.9% of women aged 40–44 years had used any contraception ( $p < .001$ , chi-square test) (Table 2). After adjustments for previous childbirth, previous pregnancy termination, marital status, employment status, educational level and region of residency in Norway, the OR for reported contraceptive use among women aged 40–44 years was 0.55 (95% CI = 0.51–0.60) as compared to women aged 20–24 years (Table 3). For women age  $\leq 19$  years, the adjusted OR for contraceptive use was 1.11 (95% CI = 1.05–1.17).

Previous childbirth (two or more), previous pregnancy termination and college/university education were also associated with reported contraception use (Table 3).

We repeated the above analyses among women aged <25 years, 25–29 years, 30–34 years and  $\geq 35$  years. In all age groups, previous childbirth, previous pregnancy termination and college/university education were associated with reported contraceptive use (data not shown).

#### 4. Discussion

Among all women who requested pregnancy termination in Norway during the years 2007–2011, 36.5% reported having used contraception when they became pregnant. In total, 11.5% of the women reported having used the condom, and 16.6% reported having used the combined contraceptive pill/progestin pill. Young age, previous childbirth, previous pregnancy termination and high level of education were associated with contraceptive use among the women who requested pregnancy termination.

##### 4.1. Sources of error

We used data from The Norwegian Registry of Pregnancy Termination to which all requests for terminations of pregnancy in Norway are reported. Since 2007 the reporting has been performed electronically, therefore we could only include requests since 2007 in our study. According to the Norwegian Abortion Act [14], termination of pregnancy within pregnancy week 12 is performed on the woman's request, and pregnancy terminations are performed (by surgery or initiated by medication) in hospitals only. Norway has public health care, and termination of pregnancy is free of charge. Biased selection to study inclusion is therefore unlikely. We cannot rule out sources of error in the form of incorrect information from the women or the doctor. However, we have little reason to believe that there is systematic incorrect reporting of contraceptive use according to age or other study factors. In addition, the requests with missing information about contraception use (1.9%) were evenly distributed across age groups. The Norwegian Registry of Pregnancy Termination holds no information about reasons for pregnancy termination or information

Table 2

The proportion and number of women who reported to use contraception when they became pregnant, according to age and type of contraceptive

	None	Rhythm method	Condom	Short-acting hormonal contraception	LARC	Sterilization	Total
	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)
Age							
< 19	59.9 (6015)	1.4 (142)	12.1 (1211)	24.1 (2416)	0.2 (24)	0.0 (2)	100 (10,038)
20–24	61.1 (13,885)	2.1 (469)	9.8 (2229)	24.4 (5547)	0.7 (148)	0.0 (7)	100 (22,743)
25–29	63.8 (11,397)	2.6 (472)	10.9 (1953)	19.3 (3446)	0.9 (156)	0.1 (21)	100 (17,850)
30–34	64.9 (8921)	3.0 (410)	12.1 (1668)	15.8 (2167)	1.6 (224)	0.3 (47)	100 (13,740)
35–39	66.4 (7152)	2.9 (314)	13.4 (1442)	11.6 (1249)	2.3 (250)	0.9 (96)	100 (10,765)
40–44	70.1 (3316)	2.9 (138)	14.1 (667)	8.0 (378)	2.0 (94)	0.9 (42)	100 (4733)
> 45	74.4 (355)	3.1 (15)	14.0 (67)	4.0 (19)	1.7 (8)	0.8 (4)	100 (477)
Total	63.5 (51,041)	2.4 (1960)	11.5 (9237)	18.9 (15,222)	1.1 (904)	0.3 (219)	100 (80,346)

LARC including intrauterine contraception (with or without levonorgestrel) and progestin subcutaneous implants; rhythm method including rhythm method, withdrawal and postcoital contraception; short-acting hormonal contraception including combined contraceptive pill/progestin pill, estrogen–progestin patch or ring and injectable contraceptives (progestin).

Proportion and number of women who reported to use other contraceptives ( $n=256$ , 0.3%) or with missing information on contraception ( $n=1507$ , 1.9%) are included in the total number, but not presented in the table.

The study population included all women with request for pregnancy termination within the end of pregnancy week 12, in Norway during the years 2007–2011 ( $n=80,346$ ).

Table 3

Odds ratio (OR) for use of contraception (all types) among women who requested pregnancy termination in Norway during the years 2007–2011 ( $n=80,346$ ) according to age, number of previous childbirths, previous pregnancy terminations, marital status, employment status and educational level

	Use of contraception % ( $n$ )		Odds ratio (OR)					
	No	Yes	OR	95% CI	aOR1	95% CI	aOR2	95% CI
Age (years)								
≤ 19	59.9 (6015)	40.1 (4023)	1.05	1.00–1.10			1.11	1.05–1.17
20–24	61.1 (13,885)	38.9 (8858)	Reference				Reference	
25–29	63.8 (11,397)	36.1 (6453)	0.89	0.85–0.92			0.86	0.82–0.89
30–34	64.9 (8921)	35.1 (4819)	0.85	0.81–0.89			0.77	0.73–0.81
35–39	66.4 (7152)	33.6 (3613)	0.79	0.76–0.83			0.67	0.63–0.71
40–44	70.1 (3316)	29.9 (1417)	0.67	0.63–0.72			0.55	0.51–0.60
≥ 45	74.4 (355)	25.6 (122)	0.54	0.44–0.66			0.45	0.37–0.60
Number of previous childbirths								
0	63.3 (23,889)	36.7 (13,829)	Reference		Reference		Reference	
1	65.8 (9929)	34.2 (5156)	0.90	0.86–0.93	1.03	0.99–1.07	0.95	0.90–0.99
≥ 2	63.7 (15,119)	36.3 (8600)	0.98	0.95–1.02	1.29	1.24–1.35	1.14	1.09–1.20
Previous pregnancy termination								
None	66.2 (30,872)	33.8 (15,739)	Reference		Reference		Reference	
1	59.8 (12,004)	40.2 (8056)	1.32	1.27–1.36	1.39	1.34–1.44	1.45	1.40–1.50
≥ 2	61.2 (5769)	38.8 (3654)	1.24	1.19–1.30	1.35	1.29–1.41	1.49	1.42–1.56
Marital status								
Married or cohabiting	63.2 (22,327)	36.8 (12,973)	Reference		Reference		Reference	
Unmarried/Single	63.6 (24,069)	36.4 (13,780)	0.99	0.96–1.02	0.90	0.87–0.93	0.94	0.90–0.97
Divorced/Widow	67.5 (2394)	32.5 (1155)	0.83	0.77–0.89	0.86	0.80–0.92	0.86	0.80–0.93
Employment status								
Paid employment, full-time/part-time	63.1 (26,830)	36.9 (15,715)	Reference		Reference		Reference	
Student	59.8 (9740)	40.2 (6559)	1.15	1.11–1.19	1.03	0.99–1.07	1.07	1.02–1.11
Student with paid employment	60.5 (1164)	39.5 (760)	1.12	1.02–1.22	1.02	0.93–1.12	1.10	1.00–1.22
Unemployed/Welfare	69.8 (9017)	30.2 (3903)	0.74	0.71–0.77	0.73	0.70–0.76	0.73	0.70–0.77
Educational level								
Elementary school	66.0 (9918)	34.0 (5120)	Reference		Reference		Reference	
High school	61.4 (21,348)	38.6 (13,427)	1.22	1.17–1.27	1.28	1.13–1.33	1.27	1.21–1.32
College/University	63.8 (11,668)	36.2 (6624)	1.10	1.05–1.15	1.28	1.22–1.34	1.39	1.32–1.47

OR, Odds ratio; aOR1, Adjusted odds ratio with adjustment for age, only; aOR2, Adjusted odds ratio with mutual adjustment for age, number of previous childbirths, previous pregnancy termination, marital status, employment status, educational level and region of residency in Norway.

about ethnic background. It is possible that some women did not have the pregnancy terminated. However, we could not identify these women in our data.

#### 4.2. Other studies

In a Swedish study from the year 2000, 64% of the women who requested pregnancy termination reported contraceptive use when they became pregnant. That study included 518 women at three hospitals in Sweden. Other studies, from the United States or France, report similar and high proportions of contraceptive users among women who request termination of pregnancy. In these studies, rhythm method/withdrawal was more commonly used (9.5–36.6%) than in our study [6–9]. The low use of rhythm method/withdrawal in our study could possibly be explained by underreporting of these methods. The use of combined contraceptive pill/progestin pill in our study is similar to in other studies.

Previous studies did not include all requests for pregnancy termination within the country. Thus, differences in selection to or in reporting of pregnancy termination could

possibly explain the lower proportion of contraceptive users in our study as compared to previous studies [6–9]. In Norway, termination of pregnancy is available free of charge to all women who request pregnancy termination [14]. In many countries in the world, access to pregnancy termination is restricted and/or expensive. Restricted access could possibly lead to selection of wealthy women to pregnancy termination, and it is possible that wealthy women use contraception more often than poor women. It is also possible that women who used contraceptives are more likely than nonusers to participate in studies of pregnancy termination. We are not aware of any previous nationwide studies of contraception use among women who request pregnancy termination.

#### 4.3. Interpretation

Our findings suggest that contraceptive failure may be an important reason for requesting pregnancy termination [6–9]. We found that contraception use was reported most often by young women, women with previous childbirth and/or pregnancy termination. These findings suggest that high fertility may be associated with contraceptive failure [15].

Use of combined contraceptive pills/progestin pill was common among the young women who requested termination of pregnancy. These findings may reflect the high prevalence of combined contraceptive pills/progestin pill use in young women as compared to older women in Norway [16]. Based on the Norwegian Prescription Database, it can be estimated that approximately 75,000 women aged 20–24 years (approximately 50% of all women in Norway in this age group) used combined contraceptive pill at any time during our study period (only 0.8% of total used progestin pill) [16–18]. If the failure rate of the combined contraceptive pill is in the range of 0.3 to 9%, the number of women who will experience failure may be between 225 and 6750 per year [19]. In our study, there were approximately 1000 yearly pregnancy terminations among combined contraceptive pills users aged 20–24 years. Far from all unplanned pregnancies are terminated. Therefore, our findings may suggest a relatively high failure rate among women who use combined contraceptive pill.

Of all women who requested termination of pregnancy, only 1.0% of had used intrauterine contraception. Among sexually active women above 30 years in Norway, intrauterine contraception is more commonly used than combined contraception pill/progestin pill [16]. However, among the women who requested pregnancy termination, women who had used the combined contraception pill/progestin pill represented a larger proportion. Thus, our results suggest low failure rate for intrauterine contraception. Our study confirms low failure rate of sterilization, since more than 10% of the women in Norway above 35 years are assumed to be sterilized [16], and sterilized women represented 0.1% only of the women who requested pregnancy termination in these age groups.

In Norway, intrauterine contraception has not been recommended in women who have not given birth, and short-acting hormonal contraceptives can be accessed free of charge for women in Norway aged 16–19 years. Such recommendation may explain the distribution of contraceptive methods in the different age groups in our study. The low number of women who reported having used contraceptives and progestin implants may be a consequence of the infrequent use of these contraceptives [16]. Our study does not allow for valid estimates of contraceptive failure rate, since only the women with pregnancy termination are included. Nevertheless, our results suggest that contraceptive failure is an important reason for pregnancy termination request.

Our findings could also suggest that older women, women without previous pregnancies and/or with high education are more inclined to continue a pregnancy following contraceptive failure than women with low education.

#### 4.4. Implications of the findings

More than 60% of the women in our study reported having used no contraception when they became pregnant.

This finding suggests that more widespread use of contraceptives still may be an important strategy to prevent pregnancy terminations. In addition, our findings suggest that more prevalent use of contraceptives with low risk of user failure could reduce pregnancy termination rates [20,21,22]. Many women above 25 years of age who requested pregnancy termination had children and also previous pregnancy termination. For some of these women, sterilization could be the contraceptive method of choice.

## 5. Conclusion

Among all women who requested pregnancy termination during a 5-year period in Norway, 36.5% reported having used contraceptive when they became pregnant. Use of contraception was associated with young age, previous pregnancies and high level of education.

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