

Family planning, reproductive health and pregnancy after bariatric surgery: a survey of bariatric healthcare professionals in Switzerland

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Summary

AIMS: A wide range of reproductive health issues, including fertility, pregnancy outcomes and contraceptive practices can be affected by morbid obesity and weight loss subsequent to bariatric surgery. This study aimed to explore the attitudes and practices of bariatric healthcare professionals in Switzerland regarding reproductive health counselling in the context of bariatric surgery.

METHODS: We conducted a national, cross-sectional, 36-question online survey among bariatric professionals in Switzerland. Survey topics included demographic factors, baseline characteristics of bariatric patients, perioperative reproductive health practices, attitudes and knowledge about contraception and recommendations regarding pregnancy. The survey was open from 1 October 2022 to 30 April 2023.

RESULTS: A total of 75 healthcare professionals participated in the survey. The majority of participants responded that female patients of reproductive age constitute more than half of the referred bariatric patients. Forty participants (57%) recommended contraception for a duration of 18–24 months following a bariatric operation. Only twenty-three respondents (31%) stated that they always refer their female bariatric patients of reproductive age to a gynaecologist prior to bariatric surgery. Fifty-six participants (75%) replied that they always discuss family planning prior to surgery. There was high variation regarding the recommended methods of contraception after surgery. Only thirty-nine participants (52%) reported that they always inform their patients about the occurrence of possible surgery-related complications during future pregnancies. More than half of the participants reported inadequate knowledge regarding absorption and safety of contraceptive pills after bariatric surgery. Although most professionals routinely follow up and provide counselling on maternal and foetal risks in pregnant women with previous bariatric surgery, forty-nine participants (65%) have no

standardised protocol for such patients who present with acute abdominal pain in their practice.

CONCLUSION: Despite acknowledging the importance of reproductive health counselling, bariatric professionals address perioperative and contraception issues inconsistently and mostly reported a lack of adequate knowledge in the latter. Therefore, a stronger collaboration between bariatric professionals and women's healthcare providers is needed to improve care of female bariatric patients of reproductive age.

Introduction

A considerable proportion of patients undergoing bariatric surgery are women of childbearing age [1]. A wide range of reproductive health issues, including fertility, pregnancy outcomes and contraceptive practices can be affected by morbid obesity and the weight loss following bariatric surgery [2]. Although bariatric surgery is associated with favourable outcomes in terms of reproductive function for women with morbid obesity [3], pregnancy in women with previous bariatric surgery may be associated with a higher maternal, foetal and perinatal risk [4, 5].

Understanding the reproductive health counselling and practices provided by bariatric surgeons is essential for ensuring comprehensive and patient-centred care. This cross-sectional survey aims to explore the attitudes and practices of bariatric healthcare professionals in Switzerland regarding reproductive health counselling in the context of bariatric surgery. By giving insight into the current landscape of reproductive health counselling and practices in the field of bariatric surgery, this study aims to contribute to the optimisation of reproductive health outcomes in female bariatric patients of reproductive age.

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Materials and methods

Design and subjects

In this cross-sectional, national study, we performed an online survey among bariatric healthcare professionals encompassing bariatric and metabolic surgeons, endocrinologists/internists and nutritionists treating patients who undergo bariatric surgery. Anonymous questionnaires were sent via electronic mail to bariatric surgeons, endocrinologists and internists treating bariatric patients via the Swiss Society for the Study of Morbid Obesity (SMOB) and to nutritionists via the Swiss Society for Nutrition (SGE-SSN), respectively. Endocrinologists at university hospitals and bariatric reference centres, as designated by SMOB, were also directly contacted via electronic mail to ensure broader outreach. The survey questionnaire consisted of a 36-item questionnaire and was created using Google Forms (Google Inc., California, USA). The questionnaire was based on questionnaires developed by previous studies which explored reproductive health practices in bariatric patients in Israel and in the United States of America [6, 7] and was adapted to the specific features of the Swiss healthcare system. It was divided into five topics (baseline characteristics of the survey participants; healthcare professional-reported baseline characteristics of bariatric patients; perioperative reproductive health practices and recommendations; attitudes and knowledge about contraception, reproductive health and family planning; practices and recommendations regarding pregnancy). Apart from three questions regarding baseline characteristics (age, years of working experience, new bariatric referrals per year), which required only free-text responses, items consisted of multiple-choice answers. Several of the latter also included options for free-text responses, enabling respondents to elaborate on their experiences and opinions beyond the provided multiple-choice options. No skip patterns were used in the survey, but the question regarding the frequency of referring pregnant patients with previous bariatric surgery to nutritionists was explicitly mentioned to be answered only by physicians. To maintain data integrity, certain questions required responses, particularly demographic questions. The survey platform also included checks to ensure that numerical entries, such as years of experience, were within a realistic range. The survey was available in English. To encourage participation, reminder emails were sent two weeks after the initial invitation. These reminders emphasised the importance of the survey and provided direct links for easy access. The survey was open from 1 October 2022 to 30 April 2023. By virtue of its design (a survey of healthcare professionals), the study did not involve patients and so a study protocol was not required.

Outcome measures

The primary outcome measure of this study was to assess the current practices and attitudes of bariatric healthcare professionals in Switzerland regarding reproductive health counselling in female patients of reproductive age undergoing bariatric surgery, specifically focusing on perioperative contraceptive practices, referrals to gynaecologists, recommendations about the type of bariatric operation and discussions about occurrence of possible complications

during pregnancy. Secondary outcome measures included the level of knowledge among bariatric professionals about the safety and efficacy of various contraceptive methods post-surgery, the perceived need for specialised staff in bariatric practices to address reproductive health issues and the implementation of standardised protocols for managing acute abdominal pain in pregnant patients post-bariatric surgery.

Statistical analysis

Continuous data is presented as medians with interquartile ranges (IQR). Categorical variables were summarised using frequencies and proportions. The frequencies of each response were calculated by dividing the number of occurrences of each response by the total number of responses. In reporting the results, all percentages were approximated to the nearest whole number by omitting decimals to simplify the presentation of data. All data analysis was performed using R version 3.5.3. R is an open-source statistical computing language, and version 3.5.3 is available under the GNU General Public License (GPL). The R package “stats” was used for basic statistical calculations such as medians and IQRs. The nature of the analysis was primarily descriptive, focusing on summarising data rather than conducting complex statistical tests. This approach was sufficient to address the research questions and objectives outlined in the study.

Results

Baseline characteristics of the survey participants

The baseline characteristics of the sample are shown in table 1. A total of 75 bariatric healthcare professionals ($n = 75$) participated in the survey. Their median age was 43 years (IQR: 37.5–49) and 45 (60%) of them were female. In terms of specialty, 32 (43%) participants were bariatric surgeons, 25 (33%) were endocrinologists/internists and 18 (24%) were nutritionists. Regarding their place of work, 32 (43%) respondents reported that they worked in a cantonal hospital and 28 (38%) in an academic hospital; the majority reported working in an urban setting ($n = 58$ or 77.3%). A little over half of respondents ($n = 39$ or 56%) stated that they received 50 or more new referrals of patients assessed for bariatric surgery per year.

Healthcare professional-reported baseline characteristics of bariatric patients

Table 2 illustrates the baseline characteristics of bariatric patients as reported by healthcare professionals in our survey. Sixty-two respondents ($n = 62$ or 83%) reported that female patients represent 51–75% of the bariatric patients who are referred for consultation to their practice. Almost half of the participants ($n = 37$ or 49%) reported that 51–75% of the bariatric female patients were of reproductive age. The majority of the participants ($n = 49$ or 67%) replied that less than a quarter of their female bariatric patients of reproductive age reported infertility prior to bariatric surgery. Similarly, the majority of the participants ($n = 60$ or 81%) stated that fewer than half of their female bariatric patients of reproductive age desired pregnancy.

The vast majority of the respondents (n= 70 or 93%) stated that fewer than a quarter of the female bariatric patients of reproductive age at their practice were referred to or desired bariatric surgery due to infertility.

Perioperative reproductive health practices and recommendations

Table 3 shows the reported perioperative reproductive health practices and recommendations of the survey participants. Twenty-three respondents (n = 23 or 31%) stated that they always refer their female bariatric patients of reproductive age to a gynaecologist prior to bariatric surgery, whereas thirteen (n = 13 or 17%) reported that they never do. The majority of the participants (n = 56 or 75%) replied that they always discuss family planning with their female bariatric patients of reproductive age prior to surgery. When asked when they discussed the need for contraception, 36 (48%) participants replied before surgery, 35 (47%) before and after surgery and 4 (5%) stated that they never discussed it. The vast majority of the bariatric healthcare professionals (n = 67 or 89%) did not routinely require oral contraception for female patients of reproductive age prior to bariatric surgery, while 58 (78%) respondents did not routinely require oral contraception after bariatric surgery. Around half of the respondents (n = 38 or 51%) did not state any specific recommendations for a specif-

ic type of bariatric surgery for women of bariatric age, 19 (25%) recommended a Roux-en-Y gastric bypass and 11 (15%) recommended a sleeve gastrectomy. Regarding the duration of contraception after bariatric surgery, the majority of participants (n = 40 or 57%) recommended contraception for a duration of 18–24 months following a bariatric operation. The most commonly recommended methods of contraception were hormonal intrauterine devices (IUDs), recommended by 50 (69%) participants, followed by contraceptive implants, non-hormonal intrauterine devices and condoms, which were recommended by 43 (60%), 42 (58%) and 35 (49%) participants respectively. The majority of participants (n = 55 or 76%) stated that their recommendation regarding the preferred method of contraception did not differ according to the type of bariatric procedure. Sixty-five bariatric professionals (n = 65 or 88%) replied that they refer their female bariatric patients of reproductive age to a gynaecologist for a prescription of contraception. Around half of the participants (n = 39 or 52%) reported that they always inform their patients about the occurrence of possible surgery-related complications during future pregnancies, such as internal hernias and intestinal obstruction, whereas twelve (n = 12 or 16%) never do. Sixty-two respondents (n = 62 or 83%) stated that they always inform their patients about possible bariatric surgery-related nutritional complications during future pregnancies.

Table 1:
Baseline characteristics of healthcare professionals.

Characteristic		
Age, in years		43 (37.5–49)
	<50	57 (76%)
	≥50	18 (24%)
Specialty	Bariatric surgeon	25 (33%)
	Internist/endocrinologist	18 (24%)
	Nutritionist	32 (43%)
Sex	Female	45 (60%)
	Male	30 (40%)
Years of working experience with morbidly obese patients	<10	38 (51%)
	≥10	37 (49%)
Hospital type	Academic hospital	28 (38%)
	Cantonal/community hospital	32 (43%)
	Private hospital	14 (19%)
Practice location	Urban	58 (77%)
	Suburban	13 (17%)
	Rural	4 (5%)
New bariatric referrals per year	<50	36 (44%)
	≥50	39 (56%)

Table 2:
Healthcare professional-reported baseline characteristics of bariatric patients.

Question		
What percentage of your bariatric patients are female? (75 responses)	≤50%	3 (4%)
	>50%	72 (96%)
What percentage of your female bariatric patients are of reproductive age? (75 responses)	≤50%	28 (37%)
	>50%	47 (63%)
What percentage of your female bariatric patients of reproductive age report infertility prior to the bariatric procedure? (73 responses, 2 missing)	≤50%	70 (96%)
	>50%	3 (4%)
What percentage of your female bariatric patients of reproductive age desire pregnancy? (74 responses, 1 missing)	≤50%	60 (81%)
	>50%	14 (19%)
What percentage of your female bariatric patients of reproductive age are referred for / desire a bariatric procedure due to infertility? (75 responses)	≤50%	74 (99%)
	>50%	1 (1%)

Attitudes and knowledge about contraception, reproductive health and family planning

Attitudes and knowledge about contraception, reproductive health and family planning are shown in table 4. Around half of the participants (n = 36 or 52%) stated that they did not feel comfortable prescribing contraception before and/or after bariatric surgery. Self-perceived level of knowledge on the safety and efficacy of various contraceptive methods in general was reported as sufficient by

20 (27%) respondents, partial by 32 (43%) and insufficient by 15 (20%). Questioned on their knowledge about the absorption and safety of oral contraceptive pills after bariatric surgery, 15 (20%) participants stated it was sufficient, 35 (47%) partial and 20 (27%) insufficient. Thirty-five participants (n = 35 or 47%) reported having adequate knowledge about the impact of bariatric surgery on infertility. Only 30 (40%) participants embraced the need for a specialised staff member in their bariatric practice to discuss reproductive health and family planning with their female patients of reproductive age.

Table 3:
Perioperative reproductive health practices and recommendations.

Question		
How often do you refer your female bariatric patients of reproductive age to a gynaecologist prior to a bariatric procedure? (75 responses)	Always	23 (31%)
	Sometimes	27 (36%)
	Never	13 (17%)
	Cannot assess	12 (16%)
How often do you discuss family planning with your female bariatric patients of reproductive age prior to a bariatric procedure? (75 responses)	Always	56 (75%)
	Sometimes	14 (19%)
	Never	0 (0%)
	Cannot assess	5 (7%)
At which time point do you discuss the need for contraception perioperatively? (75 responses)	Before and after	35 (47%)
	Before	36 (48%)
	After	0 (0%)
	Never	4 (5%)
How often do you ask female bariatric patients of reproductive age if they use contraception before undergoing bariatric surgery? (74 responses, 1 missing)	Always	51 (69%)
	Sometimes	13 (18%)
	Never	4 (5%)
	Cannot assess	6 (8%)
Do you routinely require oral contraception for female bariatric patients of reproductive age prior to a bariatric surgery? (75 responses)	Yes	8 (11%)
	No	67 (89%)
Does infertility and/or desire for pregnancy influence your recommendation about the type of bariatric procedure which is to be performed on a female bariatric patient of reproductive age? (75 responses)	Yes	22 (30%)
	No	52 (70%)
What type of bariatric operation do you generally recommend in women of reproductive age? (75 responses)	No specific recommendation	38 (51%)
	Roux-en-Y gastric bypass	19 (25%)
	Sleeve gastrectomy	11 (14%)
	Other	7 (9%)
Do you routinely recommend oral contraception to female patients of reproductive age after bariatric surgery? (74 responses, 1 missing)	Yes	16 (22%)
	No	58 (78%)
How long do you recommend contraception after bariatric surgery? (70 responses, 5 missing)	<6 months	1 (1%)
	6–12 months	2 (3%)
	12–18 months	21 (30%)
	18–24 months	40 (58%)
	>24 months	6 (9%)
Which methods of contraception do you recommend after the bariatric procedure? (multiple answers possible, 75 responses)	Condoms	35 (49%)
	Oral contraception	14 (19%)
	Implants	43 (60%)
	Intrauterine device (hormonal)	50 (69%)
	Intrauterine device (non-hormonal)	42 (58%)
	Non-applicable/Other	18 (25%)
Does your recommendation regarding postoperative contraception differ according to the type of bariatric procedure performed? (72 responses, 3 missing)	Yes	17 (24%)
	No	55 (76%)
How do patients obtain a prescription for contraception in your bariatric practice? (74 responses, 1 missing)	Referred to gynaecologist	65 (88%)
	Other	9 (12%)
How often do you inform your patients about possible occurrence of surgical, bariatric surgery-related complications during future pregnancies, such as internal hernias and intestinal obstruction? (75 responses)	Always	39 (52%)
	Sometimes	16 (21%)
	Never	12 (16%)
	Cannot assess	8 (11%)
How often do you inform your patients about the potential impact of nutritional deficiencies after bariatric surgery on future pregnancies? (75 responses)	Always	62 (83%)
	Sometimes	11 (15%)
	Never	1 (1%)
	Cannot assess	1 (1%)

Practices and recommendations regarding pregnancy

Table 5 shows the practices and recommendations of bariatric healthcare professionals regarding pregnancy in female bariatric patients obtained through the survey. The survey responses of the participants by clinical group are summarised in table 6. The majority of the respondents (n = 54 or 72%) replied that they always provide pregnant patients who had undergone bariatric surgery with counselling on maternal and foetal risks. A majority also said that they regularly follow up female patients after bariatric surgery during pregnancies in their outpatient clinic (n= 61 or 81%) and routinely refer pregnant patients with previous bariatric surgery to a dietitian/nutritionist (n = 59 or 82%). A standardised protocol for management of acute abdominal pain in pregnant patients with previous bariatric surgery did not reportedly exist in the practice of 49 (65%) participants.

Discussion

The main finding of this study was the discrepancy among bariatric healthcare professionals in Switzerland regarding perioperative reproductive healthcare practices and recommendations in female patients undergoing bariatric surgery. Moreover, this study showed a reported lack of sufficient knowledge among the survey participants about contraception and reproductive health issues. Additionally, this study showed that reproductive-aged women likely represent more than half of bariatric patients in Switzerland. These findings highlight the urgent need for raising awareness among bariatric healthcare professionals about reproductive health issues. It can also be concluded that a stronger collaboration between bariatric teams and women's health experts is prudent to achieve optimal perioperative consulting and management of female bariatric patients of childbearing age.

According to Swiss Society for the Study of Morbid Obesity (SMOB) guidelines, female patients should delay pregnancy for 12–18 months after bariatric surgery, because the rapid catabolic weight-loss period may pose a risk to the foetus [8]. This recommendation is endorsed by 30% of the study participants, while most of the participants (57%)

Table 4:
Attitudes and knowledge about contraception, reproductive health and family planning.

Question		
How comfortable do you feel in prescribing contraception before and/or after bariatric surgery? (69 responses, 6 missing)	Very comfortable	4 (6%)
	Comfortable	12 (17%)
	Somewhat comfortable	17 (25%)
	Not comfortable	36 (52%)
Do you feel that you have sufficient knowledge about the efficacy and safety of various contraceptive methods in general? (74 responses, 1 missing)	Yes	20 (27%)
	Partially	32 (43%)
	No	15 (20%)
	Cannot assess	7 (10%)
Do you feel that you have sufficient knowledge about the absorption and the safety of contraceptive pills after bariatric surgery? (74 responses, 1 missing)	Yes	15 (20%)
	Partially	35 (47%)
	No	20 (27%)
	Cannot assess	4 (5%)
Do you feel that you have sufficient knowledge about the impact of weight loss on infertility? (73 responses, 2 missing)	Yes	46 (63%)
	Partially	23 (32%)
	No	4 (6%)
Do you feel that you have adequate knowledge about the impact of bariatric surgery on infertility and resolution of reproductive health issues? (74 responses, 1 missing)	Yes	35 (47%)
	Partially	31 (42%)
	No	8 (11%)
In your opinion, is a specialised staff member needed in your bariatric practice to discuss family planning and reproductive health counselling for female patients of reproductive age undergoing bariatric surgery? (75 responses)	Yes	30 (40%)
	No	35 (47%)
	Cannot assess	10 (13%)

Table 5:
Practices and recommendations regarding pregnancy.

Question		
If a pregnant patient presents in your outpatient clinic after bariatric surgery, do you provide counselling on maternal and foetal risks? (75 responses)	Always	54 (72%)
	Sometimes	9 (12%)
	Never	3 (4%)
	Cannot assess	9 (12%)
Do you regularly follow up pregnant patients with previous bariatric surgery during pregnancy? (75 responses)	Yes	61 (81%)
	No	14 (19%)
Do you routinely refer pregnant patients with previous bariatric surgery to a dietitian/nutritionist? (the question refers only to physicians) (57 responses)	Yes	49 (86%)
	No	8 (14%)
Do you have a standardised protocol for the management of a pregnant patient with previous bariatric surgery who presents with acute abdominal pain in your practice? (75 responses)	Yes	26 (35%)
	No	49 (65%)

Table 6:
Responses of the participants categorised by clinical group.

		Bariatric surgeons		Internists/ endocrinologists		Nutritionists	
		n = 32		n = 25		n = 18	
		Responses	Percentage	Responses	Percentage	Responses	Percentage
How often do you refer female bariatric patients of reproductive age to a gynaecologist prior to a bariatric procedure?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Always	10	31%	8	32%	5	28%
	Sometimes	15	47%	10	40%	2	11%
	Never	5	16%	5	20%	3	17%
	I cannot assess	2	6%	2	8%	8	44%
How often do you discuss family planning with your female bariatric patients of reproductive age prior to a bariatric procedure?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Always	27	84%	21	84%	8	44%
	Sometimes	5	16%	2	8%	7	39%
	Never	0	0%	0	0%	0	0%
	I cannot assess	0	0%	2	8%	3	17%
At which time point do you discuss the need for contraception perioperatively?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Never	0	0%	1	4%	3	17%
	Before surgery	17	53%	11	44%	8	44%
	After surgery	0	0%	0	0%	0	0%
	Before and after surgery	15	47%	13	52%	7	39%
How often do you ask female patients of reproductive age if they use contraception before undergoing bariatric surgery?		(Total: 31 responses, 1 missing)		(Total: 25 responses)		(Total: 18 responses)	
	Always	24	77%	18	73%	7	39%
	Sometimes	7	23%	7	27%	4	22%
	Never	0	0%	0	0%	3	17%
	I cannot assess	0	0%	0	0%	4	22%
Do you routinely require oral contraception for female patients of reproductive age prior to a bariatric procedure?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Yes	2	6%	2	8%	4	22%
	No	30	94%	23	92%	14	78%
Does infertility and/or desire for pregnancy influence your recommendation about the type of bariatric procedure which is to be performed on a female bariatric patient of reproductive age?		(Total: 32 responses)		(Total: 25 responses)		(Total: 17 responses, 1 missing)	
	Yes	10	31%	9	36%	3	18%
	No	22	69%	16	64%	14	82%
What type of bariatric operation do you generally recommend in women of reproductive age?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Sleeve gastrectomy	1	3%	6	24%	4	22%
	Roux-en-Y gastric bypass	13	41%	4	16%	2	11%
	No specific recommendation	17	53%	13	52%	8	44%
	Other	1	3%	2	8%	4	22%
Do you routinely recommend oral contraception to female patients of reproductive age after bariatric surgery?		(Total: 32 responses)		(Total: 25 responses)		(Total: 17 responses, 1 missing)	
	Yes	6	19%	7	28%	3	18%
	No	26	81%	18	72%	14	83%
How long do you recommend contraception after bariatric surgery?		(Total: 31 responses, 1 missing)		(Total: 25 responses)		(Total: 14 responses, 4 missing)	
	<6 months	0	0%	1	4%	0	0%
	6–12 months	1	3%	1	4%	0	0%
	12–18 months	13	42%	5	20%	3	21%
	18–24 months	16	52%	17	68%	7	50%
	>24 months	1	3%	1	4%	4	29%
Does your recommendation regarding postoperative contraception differ according to the type of bariatric procedure performed?		(Total: 32 responses)		(Total: 25 responses)		(Total: 15 responses, 3 missing)	
	Yes	7	22%	7	28%	3	20%
	No	25	78%	18	72%	12	80%
How do patients obtain a prescription for contraception in your bariatric practice?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Prescribed by bariatric surgeon	0	0%	0	0%	0	0%
	Prescribed by physician	0	0%	0	0%	1	6%
	Referred to gynaecologist	30	94%	25	100%	10	56%
	Referred to primary care practitioner	0	0%	0	0%	0	0%
	Other	2	6%	0	0%	7	39%
How often do you inform your patients about possible occurrence of surgical, bariatric surgery-related complications during		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Always	23	72%	10	40%	6	33%

future pregnancies, such as internal hernias and intestinal obstruction?	Sometimes	6	19%	8	32%	2	11%
	Never	3	9%	4	16%	5	28%
	I cannot assess	0	0%	3	12%	5	28%
How often do you inform your patients about the potential impact of nutritional deficiencies after bariatric surgery on future pregnancies?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Always	27	84%	22	88%	13	72%
	Sometimes	4	13%	2	8%	5	28%
	Never	1	3%	0	0%	0	0%
	I cannot assess	0	0%	1	4%	0	0%
How comfortable do you feel in prescribing contraception before and/or after bariatric surgery?		(Total: 32 responses)		(Total: 25 responses)		(Total: 12 responses, 6 missing)	
	Very comfortable	0	0%	1	4%	3	25%
	Comfortable	6	19%	5	20%	1	8%
	Somewhat comfortable	7	22%	7	28%	3	25%
	Not comfortable	19	59%	12	48%	5	42%
Do you feel that you have sufficient knowledge about the efficacy and safety of various contraceptive methods in general?		(Total: 32 responses)		(Total: 25 responses)		(Total: 17 responses, 1 missing)	
	Yes	8	25%	9	36%	3	18%
	Partially	14	44%	14	56%	4	24%
	No	10	31%	2	8%	3	18%
	I cannot assess	0	0%	0	0%	7	41%
Do you feel that you have sufficient knowledge about the absorption and safety of contraceptive pills after bariatric surgery?		(Total: 32 responses)		(Total: 25 responses)		(Total: 17 responses, 1 missing)	
	Yes	5	16%	6	24%	4	24%
	Partially	16	50%	16	64%	3	18%
	No	11	34%	3	12%	6	35%
	I cannot assess	0	0%	0	0%	4	24%
Do you feel that you have sufficient knowledge about the impact of weight loss on infertility?		(Total: 31 responses, 1 missing)		(Total: 25 responses)		(Total: 17 responses, 1 missing)	
	Yes	16	52%	18	72%	12	71%
	Partially	11	36%	7	28%	5	29%
	No	4	13%	0	0%	0	0%
Do you feel that you have adequate knowledge about the impact of bariatric surgery on infertility and resolution of reproductive health issues?		(Total: 32 responses)		(Total: 25 responses)		(Total: 17 responses, 1 missing)	
	Yes	14	44%	16	64%	5	29%
	Partially	12	38%	8	32%	11	65%
	No	6	19%	1	4%	1	6%
In your opinion, is a specialised staff member needed in your bariatric practice to discuss family planning and reproductive health counselling for female patients of reproductive age undergoing bariatric surgery?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Yes	14	44%	6	2%	10	56%
	No	13	41%	17	6%	5	28%
	I cannot assess	5	16%	2	8%	3	17%
If a pregnant patient presents in your outpatient clinic after bariatric surgery, do you provide counselling on maternal and foetal risks?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Always	20	63%	22	88%	12	67%
	Sometimes	7	22%	1	4%	1	6%
	Never	0	0%	2	8%	1	6%
	I cannot assess	5	16%	0	0%	4	22%
Do you regularly follow up pregnant patients with previous bariatric surgery during pregnancy?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Yes	22	69%	23	92%	16	89%
	No	10	31%	2	8%	2	11%
Do you routinely refer pregnant patients with previous bariatric surgery to a dietitian/ nutritionist? (the question refers only to physicians)		(Total: 32 responses)		(Total: 25 responses)			
	Yes	26	81%	23	92%	N/A	
	No	6	19%	2	8%	N/A	
Do you have a standardised protocol for the management of a pregnant patient with previous bariatric surgery who presents with acute abdominal pain in your practice?		(Total: 32 responses)		(Total: 25 responses)		(Total: 18 responses)	
	Yes	11	34%	10	40%	5	28%
	No	21	66%	15	60%	13	72%

recommended an even stricter period of 18–24 months. Similarly, in a previous survey conducted among members of the American Society for Metabolic and Bariatric Surgeons (ASMBS), around 87% of the respondents recommended a postoperative delay of 12–24 months [6].

Our study showed that more than 90% of the Swiss bariatric professionals discuss the need for perioperative contraception either before, or before and after bariatric surgery. This finding shows that bariatric professionals acknowledge the importance of delaying pregnancy after

bariatric surgery. However, fewer than one fifth of the study participants felt comfortable about prescribing contraception perioperatively. Still, only one third of the bariatric professionals routinely referred female patients of reproductive age to a gynaecologist prior to bariatric surgery. This demonstrates a major gap in the care of female bariatric patients of reproductive age, because it implies that a significant number of patients may not obtain optimal gynaecological counselling about contraception issues before undergoing bariatric surgery.

Despite the majority of surveyed professionals recommending contraception for 18–24 months post-bariatric surgery, there is a notable variation in their preferred methods, with a reliance on hormonal intrauterine devices, implants and non-hormonal methods. This variation reflects the broader uncertainty in the literature about the most effective and safest contraceptive options post-surgery, particularly regarding the altered absorption rates of oral contraceptives after procedures like Roux-en-Y gastric bypass [9]. Recommendations for contraceptive methods such as hormonal intrauterine devices and implants align with suggestions from current guidelines that strongly endorse non-oral methods due to their reliable efficacy unaffected by altered gastrointestinal absorption [10]. The discrepancy between the survey responses and the more definitive recommendations in the literature underscores the need for continued education and dissemination of evidence-based guidelines to bariatric professionals. Additionally, the survey revealed a lack of consensus on the safest bariatric procedure for future pregnancies, with no clear preference for Roux-en-Y gastric bypass or sleeve gastrectomy. This lack of consensus is in accordance with previous observational studies suggesting that Roux-en-Y gastric bypass or sleeve gastrectomy do not lead to any difference in maternal nutrition and foetal growth [11–13]. However, there is a need for prospective studies to provide robust, procedure-specific evidence to guide bariatric professionals in recommending the most suitable bariatric procedure for female patients of childbearing age.

The importance of comprehensive contraceptive counselling in women of reproductive age undergoing bariatric surgery, including knowledge of non-oral contraceptive methods has been previously highlighted [14]. As a result, the reported lack of adequate knowledge about the efficacy and safety of contraceptive methods in general and after bariatric surgery is a worrisome finding of our study. Fewer than one third of the study participants reported sufficient knowledge about the efficacy and safety of various contraceptive methods. Although this finding was more prominent among bariatric surgeons, the two other clinical groups also reported poor knowledge about these issues. Only 25% of the bariatric surgeons and 36% of the internists/endocrinologists claimed adequate knowledge about contraception issues in general, while even fewer physicians reported sufficient knowledge about such issues in patients after bariatric surgery (16% of the surgeons and 24% of the internists). Still, around half of the study participants did not embrace the need for specialised staff for reproductive health issues in their practice. Accordingly, previous surveys conducted among members of the American Society for Metabolic and Bariatric Surgeons and members of the British Obesity and Metabolic Surgery Society (BOMSS) showed low rates of accurate knowledge of contraceptive safety and effectiveness among bariatric healthcare providers [15, 16]. Obstetrician- gynaecologists uniquely acquire the needed expertise to weigh contraceptive method effectiveness and adverse effects [17]. Hence, our study's findings underline the importance of the routine preoperative referral of female bariatric patients to a women's health expert to optimise access to contraceptive counselling.

Bariatric surgery has been shown to increase chances of conception in obese women with anovulatory cycles [18]. Moreover, it has been associated with a decrease in menstrual irregularities six months postoperatively and with an increase in sex hormones [19]. In our study, only half of the bariatric surgeons claimed to have adequate knowledge about the impact of weight loss on infertility, while less than half of the bariatric professionals felt sufficiently informed about the benefit of bariatric surgery regarding resolution of infertility. Scientific societies of bariatric healthcare professionals should focus on offering seminars and educational material about the beneficial impact of bariatric surgery on female fertility.

Pregnant women post-bariatric surgery have an increased risk of developing micronutrient deficiencies [20]. Furthermore, pregnancies after bariatric surgery have been associated with an increased risk of small-for-gestational age infants, shorter gestation and possibly higher rates of stillbirth or neonatal death [21]. It has been suggested that pregnancy in women post-bariatric surgery should be planned and preconception nutritional supplementation should be monitored and optimised 3–6 months prior to conception [10]. The necessity for regular follow-up of pregnant women after bariatric surgery by bariatric and nutritional outpatient clinics was acknowledged by most of the survey participants. A possible contributing factor to the increased foetal risk is the occurrence of surgical complications, which may also result in severe maternal morbidity. Among them, small bowel obstruction after Roux-en-Y gastric bypass, caused by internal herniation, bezoars, kinking or intussusception at the site of the jejunojeunostomy, can be life-threatening in case of misdiagnosis or late recognition [22]. More than half of the survey participants stated that they always inform their patients about such risks during future pregnancies, but bariatric surgeons were reportedly those who mostly mention surgical risks. However, a standardised protocol for the management of acute abdominal pain in pregnant patients is lacking in the majority of the bariatric practices. Such protocols may be of utmost clinical significance given that use of appropriate imaging modalities and early operative intervention may be crucial in the treatment of these patients.

This study has several limitations, which need to be addressed. One significant limitation is the inability to calculate a precise response rate. Although the survey was sent to all members of SMOB and the Swiss Society for Nutrition (SGE-SSN), not all members responded to it. In addition, estimating the total number of professionals who were contacted for this survey is challenging, as the exact number of active members in the participating societies is not definitively known. Moreover, some endocrinologists treating bariatric patients may not be SMOB members. Although a significant number of endocrinologists were reached by electronic mail, some endocrinologists likely did not receive the invitation to participate in the survey. As a result, a response rate cannot be provided, which limits the generalisability of the study results. Furthermore, the relatively small number of participants may be attributed to the varying levels of engagement or interest among healthcare professionals regarding the topic of perioperative reproductive health counselling, as well as potential logistical challenges in survey dissemination. It can be as-

sumed that study participants may have been more familiar with the survey's issues than those who did not participate in it. This may have led to a selection bias. However, given the distribution of the participants in terms of age, sex, hospital type, practice location, years of working experience and caseload, it can be argued that the sample is representative of the healthcare professionals in Switzerland treating bariatric patients. Of note, this is the first study exploring the subject of perioperative reproductive health counselling in bariatric patients in Switzerland. This is also one of the few studies capturing the attitudes, practices and knowledge of bariatric healthcare professionals beyond surgeons alone.

Conclusion

This study revealed a lack of consistency in reproductive health counselling and perioperative management offered by bariatric professionals to childbearing-aged female patients in Switzerland. Moreover, bariatric healthcare providers reported low levels of knowledge regarding contraception and fertility issues in the context of bariatric surgery. Bariatric, endocrinological and nutritional healthcare societies should focus on enhancing education of healthcare professionals practicing bariatric care in reproductive health issues. By fostering a deeper understanding of this field, bariatric professionals can offer preoperative counselling, personalised postoperative care and informed guidance on family planning to support the reproductive wellbeing of female patients undergoing bariatric surgery. Furthermore, stronger collaboration between bariatric healthcare providers and women's health experts is needed to optimise delivery of perioperative and postoperative healthcare in women undergoing bariatric surgery, focusing on contraception, family planning and pregnancy outcomes.

Data availability statement

The data supporting the findings of our study has been deposited in the Open Science Framework (OSF) and is publicly accessible at: https://osf.io/a26by/?view_only=654f7161ca2c4865a82e1ad42084b745. Researchers interested in accessing more detailed data are encouraged to contact the corresponding author.

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Potential competing interests

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflict of interest related to the content of this manuscript was disclosed.

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