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Title: Future women's health providers' willingness to provide abortion services following decriminalization of abortion in Chile: a cross-sectional survey

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Strengths and limitations of this study

- This study assesses Chilean medical and midwifery student's willingness and concerns about providing abortion services soon after the complete ban on abortion was lifted.
- We capture a range in students' views about abortion provision by successfully recruiting students from secular, religious, public and private universities and by reaching students seeking either medical and midwifery degrees.
- This study includes important explanatory variables including political affiliation, religion, frequency of attendance at religious services and year in medical or midwifery school.
- Students from religious universities were underrepresented and our response rate was low. Thus, the views presented here are likely more supportive of abortion than medical and midwifery students across the country.

Abstract

Objective: To assess Chilean medical and midwifery students' attitudes and willingness to provide abortion care, shortly after abortion was decriminalized.

Design: From October 2017 to May 2018, we fielded a cross-sectional, web-based survey regarding students' attitudes and willingness to provide abortion-related care. We used generalized estimating equations to assess differences by university and the type of degree sought.

Setting: A combination of seven secular, religiously-affiliated, public and private universities that offer midwifery or medical degrees with a specialization in obstetrics and gynecology, located in Santiago, Chile, served as recruitment sites.

Participants: All students seeking medical or midwifery degrees at one of seven universities were eligible to participate. We distributed the survey link to medical and midwifery students at these seven universities; 459 eligible students opened the survey link and 377 students completed the survey.

Primary and secondary outcomes: Intentions to provide abortion-related services is our primary outcome of interest. Secondary outcomes included moral views and concerns about abortion provision.

Results: Most students agreed that their university should train medical and midwifery students to provide abortion services (70%-78%), that they plan to become trained to provide abortion services (69%), and that providing abortions is a positive contribution to society (57%); 20% reported that they will not provide an abortion under any circumstance and 16% agreed that providing abortions is morally wrong. Secular university students reported higher intentions to provide abortion services, more favorable views and fewer concerns about abortion provision than students from religious universities.

Conclusion: Medical and midwifery students are interested in receiving training and providing abortion care, and believe their university should provide this training. Integrating high quality training in abortion care into medical and midwifery programs will be critical to ensuring that women receive timely, nonjudgmental and quality abortion care.

Introduction

In August 2017, Chile's constitutional tribunal approved allowing abortion when the woman's life is in danger, lethal fetal anomaly, and for pregnancies due to rape. In the 1990s, when abortion was completely banned, abortion providers consisted of a mix of trained and untrained providers, many of whom had low levels of education and literacy, resulting in high rates of maternal mortality due to abortion. [1] During that period, practitioners reported a fear of prosecution when treating women with fetal or maternal complications [2], which may in part explain why healthcare providers and hospitals have been responsible for filing the majority of cases against women who have abortions.[3] Since that time, maternal mortality due to abortion has decreased considerably, [4] owing to increased access to contraception, misoprostol, and higher quality post-abortion care.[2 5]

Legal reform introduces a new challenge and opportunity for prospective women's health providers. They must now consider whether or not they are willing to develop their skills in order to fill a critical service gap, in an environment that lacks experienced clinicians and has limited capacity to provide abortion services. The extent to which future providers welcome, reject, and/or are concerned about providing abortion-related care, now that it abortion is legally permissible, is unclear. This study aims to deepen our understanding of medical and midwifery students' attitudes, concerns, and willingness to provide abortion-related care, a critical step in identifying the country's future abortion training needs.

Materials and Methods

Study design

We conducted a cross-sectional survey of prospective women's health providers seeking medical or midwifery degrees at universities located in the metropolitan region of Santiago, Chile's capital. We powered our sample to detect mean differences in abortion attitudes by university type (secular vs religious university) and degree type (medical vs midwifery). We estimated that a sample of

300, with a minimum group size of 90, could detect a mean difference of 0.45, on a 4-point scale, and as reported in a published abortion stigma subscale, with a standard deviation of 1.07, and a two-sided alpha of 5% and 80% power.[6]

Recruitment procedures

We selected a combination of seven secular, religiously-affiliated, public and private universities that offer midwifery or medical degrees with a specialization in obstetrics and gynecology, located in Santiago, Chile, to serve as recruitment sites. This included seven medical and five midwifery departments within these seven universities. Based on a review of the Ministry of Education and university websites, we estimated that the seven participating universities serve over 7,000 students seeking these degrees. We requested department administrators and student leaders to distribute a survey link to their medical and midwifery students. Six departments at four universities shared the link with students directly, through student listservs or department Facebook pages. At the two non-responding universities, we distributed paper flyers that included the survey link and a QR code to medical and midwifery students. Interested participants were entered into a gift card drawing (worth $40 USD/24,000 Chilean pesos) of 25 randomly-selected winners. The study protocol received ethical approval from the University of Diego Portales, Santiago, Chile.

Survey administration

We fielded a web-based, anonymous survey from October 2017 to May 2018. Students seeking a medical or midwifery degree at one of the seven identified universities were eligible to participate. Interested students reviewed an online consent form, consented, and completed the survey. The survey assessed students' moral views,[7] intentions,[8] and concerns about providing abortion,[9] which were drawn from the published literature, and adapted to be applicable to university students and in a context in which provision of abortion had not been previously legal.

Patient and public involvement

Prior to developing the student survey, we conducted 30 in-depth qualitative in-person interviews with clinical teaching faculty at the same seven universities where we intended to survey students, and within the schools' OB/GYN and midwifery departments. Findings from the faculty interviews, informed the development of the research questions and the development of the student survey. A summary of the findings from faculty and students has been at several medical schools and reproductive health professionals. We did not include patient involvement in the design of this study.

Outcome variables

We examined five outcomes related to three abortion-provision domains. Concerns about abortion provision included: "Now that abortion is legal in certain circumstances, to what extent do the following factors related to abortion provision concern you?" Followed by seven, likert-scaled (1-strongly disagree to 5-strongly agree) items: "It is against my personal values", "I fear that I would have legal problems", "It is against my religious beliefs", "It is outside my scope of practice", "I fear that either I or my family may be harassed and/or threatened by others", "I may be ostracized by my colleagues and/or discriminated against in my profession", and "I fear being rejected by my family or friends". Average scores across items served as our *concerns about abortion provision* outcome. *Having one or more concern* served as a dichotomous outcome which included anyone who agreed or strongly agreed with any of these seven items. Moral views about abortion provision included respondents' level of agreement (1-strongly disagree to 5-strongly agree) with five items: "The needs of a patient are more important than the beliefs of a clinician", "Abortion should be covered as part of public health services", "Providing abortions is a positive contribution to society", "Clinicians have a responsibility to counsel patients against having an abortion" and "I feel that providing abortions is morally wrong". After reverse coding the latter two items, average scores across items served as a continuous *morally favorable views about abortion provision* outcome. For intentions to provide abortion-related services

participants were asked "Now that abortion is legal in some circumstances, how do you think this will affect your future practice?", and to indicate their level of agreement (1-strongly disagree to 4-strongly agree) with four items: "I plan to become trained to provide abortion services", "I will try to convince other doctors to provide abortions", "If a female patient requested an abortion, I would try to discourage her from seeking the procedure", and "I will not provide an abortion under any circumstance." After reverse coding the latter two items, average scores served as one continuous outcome. Endorsement (agreed/strongly agreed) of *I plan to become trained to provide abortion services* served as final dichotomous outcome.

Independent variables

Independent variables included university type (secular or religious), gender, age group, degree type (medicine-undecided specialty, medicine-obstetrics and gynecology specialty, and midwifery), political affiliation (none/center, right/center right, and left/center left), religion (Catholic or other religion vs none/atheist/agnostic), frequency of attendance to religions services, year in medical/midwifery school, region where student completed high school (Santiago vs other), and as a proxy for socioeconomic status, type of high school attended (public, private-subsidized, and private-self-paid).

Analyses

We estimated frequencies for participant and university characteristics (Table 1) and each abortion provision domain, including their internal consistency Cronbach's alpha reliability coefficients (Table 2). For multivariable models, we used linear and logistic general estimating equation (GEE) models accounting for clustering by university. To test associations between participant characteristics and our main outcomes, we selected model covariates known to be associated with abortion attitudes, based on the existing literature [10]. We conducted all analyses in STATA 14. Significance was reported at $P \leq .05$.

Results

Respondent characteristics

The survey link was distributed to 2,148 medical and midwifery students and 459 opened the survey link; we removed 46 surveys due to ineligibility, and 36 surveys that were less than 40% complete or were missing outcome data, leaving a final sample of 377 and a response rate of (18%, 377/2,148). There were no statistically significant differences by gender, religion, age, year in school, type of school, degree pursuit, or political affiliation between our final sample (n=377) and those with incomplete surveys (n=36). We describe student and university characteristics in Table 1. Most students attended a secular university (77%), 63% a private university, and 75% were seeking a medical degree (49% undecided specialty and 26% with specialization in obstetrics and gynecology). Most students felt that their university should provide abortion training to all medical students (70%), medical students with an Ob/Gyn specialty (79%), and to midwifery students (78%, Table 2). After removing all observations with missing outcome data, there were no missing data for any of the independent variables of interest. However, there were 68 missing responses for the question asking students if their university should provide abortion training to their students.

Concerns, moral views and intentions to provide abortion-related services

Half (50%) of students agreed/strongly agreed that they had one or more concern about providing abortion-related services. Primary concerns included: providing abortion was against their personal values (32%) or religious beliefs (18%) and a fear of legal problems (23%, Table 3). Overall concerns about providing abortion-related services were significantly higher among students attending religious than those attending secular universities (mean 2.59 vs 1.84, $p<.05$), with no statistically significant differences by the type of degree being pursued.

Over three-quarters (77%) of students agreed/strongly agreed that the needs of a patient are more important than the beliefs of a clinician, 61% agreed that abortion should be covered as part of

public health services, 57% agreed that providing abortions is a positive contribution to society, and 16% agreed that providing abortions is morally wrong (Table 3). Students from secular universities were significantly more likely to hold morally favorable views about abortion provision than students from religious universities (mean 3.97 vs 2.92, p<.05), with no statistically significant differences by type of degree being pursued.

Nearly two-thirds (69%) of students agreed/strongly agreed that they plan to become trained to provide abortion services but only 21% would try to convince other doctors to provide abortion services. Approximately one in five students agreed that they would discourage a woman from seeking an abortion (21%) and that they will not provide an abortion under any circumstance (20%). Students from secular universities had significantly higher overall intentions to provide abortion-related services than students from religious universities (mean 2.99 vs. 2.11, p<.05). Medical students specializing in obstetrics and gynecology (24%) were significantly (p<.05) more likely than medical students who had not yet decided on their specialty (10%) to agree they would try to discourage a patient from seeking an abortion. Midwifery students (11%) were less likely than medical students (24%) to say they would try to convince other doctors to provide abortions.

In multivariable analyses, factors associated with having one or more concern about abortion provision included having a right/center right political affiliation (aOR 2.96, CI: 1.42, 6.19) and attending religious services frequently (aOR 5.14, CI: 1.73, 15.26, Table 4). Factors associated with lower odds of having concerns about abortion provision included attending a secular university (aOR 0.47, CI: 0.23, 0.95) and identifying as atheist, agnostic or of no religion (aOR 0.47, CI: 0.23, 0.95).

Factors associated with having morally favorable views about abortion provision included attending a secular university (Beta 0.52, CI: 0.32, 0.72), being female (Beta 0.21, CI: 0.05, 0.37), having completed their high school education in Santiago (Beta 0.19, CI: 0.02, 0.36), identifying as left/center left political affiliation (Beta 0.23, CI: 0.05, 0.41), and being in the last few years of medical/midwifery

school (Beta 0.34, CI: 0.09, 0.58, Table 4). Those who identified as right/center right political affiliation (Beta -0.52, CI: -0.72, -0.31) or attended religious services frequently (Beta -0.91, CI: -1.16, -0.65) were less likely to hold morally favorable views about abortion provision.

Factors associated with overall intentions to provide abortion services and specifically having plans to get trained to provide abortion services included attending a secular university (Beta 0.47, CI: 0.31, 0.63 and aOR 2.74, CI: 1.38, 5.43, respectively), having a left/center left political affiliation (Beta 0.20, CI: 0.06, 0.34 and aOR 2.22, CI: 1.01, 4.07), and being in the 3rd or 4th year in medical/midwifery school (Beta 0.17, CI: 0.02, 0.33 and aOR 2.48, CI: 1.09, 5.28, Table 5). Identifying as atheist, agnostic or of no religion was associated with higher overall intentions to provide abortion services (Beta 0.24, CI: 0.09, 0.39). Factors associated with fewer overall intentions and plans to become trained to provide abortion services included being ages 25 and older (Beta -0.29, CI: -0.47, -0.10 and aOR 0.35, CI: 0.14, 0.87), having a right/center right political affiliation (Beta -0.42, CI: -0.58, -0.26 and aOR 0.45, CI: 0.22, 0.90), and attending religious services frequently (Beta -0.60, CI: -0.80, -0.40 and aOR 0.16, CI: 0.06, 0.41).

Discussion

Findings from this study highlight widespread support among prospective women's health clinicians to build a qualified workforce to provide abortion services under the current law in Chile. The vast majority of secular and over one-third of religiously-affiliated university students have intentions to provide abortion services. Most students, even those at religious universities, felt that they should receive abortion-related training and moral opposition to abortion was low. Religious university students' desire to receive abortion training is in conflict with the position that their universities have taken—to claim institutional-level refusals to provide abortion care at their hospitals.[11 12]

More than half (57%) of students believe providing abortion services is a positive contribution to society and few (16%) thought that providing abortions is morally wrong. Holding morally favorable

views about abortion provision was higher among students who were further along in their medical and midwifery training suggesting that experience may impact students' willingness to provide such services. However, participants' views and intentions to provide abortion services are likely to change even further once they become practicing clinicians, as organizational barriers may deter interested clinicians from abortion provision.[13 14]

Along with the high level of support and intentions to provide abortion services, over half of students held concerns, mainly related to their personal values and religious beliefs, but also due to a fear of legal problems and of being harassed or threatened. These concerns may be well-founded, as evidenced by the public defaming of the physician who performed the first legal abortion in the country.[15] Furthermore, the broad adoption of conscientious objector status among clinicians and institutions[16] may be a product of and/or contributor to the stigma of being an abortion provider. Clinicians in Chile may require extensive support professionally in order to ensure that they feel safe providing abortion services to women.

Consistent with numerous studies documenting the relationship between political views, religiosity and abortion attitudes among medical students, clinicians, and the general public,[17-19] we found that students' political affiliation and frequency of religious attendance was strongly associated with students' moral views and willingness to provide abortion services. Students' religious beliefs are likely to influence their clinical opinions and interactions, and thus they may benefit from training to ensure that they are able to provide nonjudgmental services. Studies in the United States have found that Ob/Gyn residents who were morally opposed to abortion but partially participated in an abortion training program, felt they gained important clinical and professional skills from the abortion training.[20 21] Whether medical and midwifery programs in Chile are prepared to offer abortion training, and whether they will require their students to participate at some level, is still unclear.

While this study successfully reached students from secular and religious universities, students from religious universities were underrepresented and our response rate was low. Thus, the views presented here are likely more supportive of abortion than medical and midwifery students across the country. Nonetheless, students' attitudes about abortion provision are similar to those reported among obstetricians and gynecologists in Argentina,[22] a country that also has very restrictive abortion laws.

Conclusions

This is the first study to assess Chilean medical and midwifery student's willingness to provide abortion services following legal reform. Students are interested in receiving training and providing abortion care to women and believe their university should provide this training. Ensuring that high quality training in abortion care is integrated within medical and midwifery programs will be critical to ensuring that women receive timely, nonjudgmental and quality abortion care.

Table 1. Participant characteristics (N=377)

	N	%
Gender		
Female	239	64
Male	136	36
Other	1	<1
Age group		
17-19	95	25
20-24	222	59
25-37	60	16
Attends secular university	292	77
Attends private university	262	63
Degree pursuit		
Midwifery/Obstetrics	94	25
Medicine-Undecided specialty	186	49
Medicine-Gynecology specialty	97	26
University year		
1st-2nd	163	43
3rd-4th	127	34
5th-6th	47	12
Last year/Just graduated	40	11
Born in Chile	368	98
Region where graduated high school		
Santiago metropolitan region	285	76
Northern Chile	34	9
Southern Chile	54	14
Other country	4	1
Not married	369	98
Political affiliation		
Right/Center right	95	25
Center	32	8
Center left/left	171	45
None	79	21
Frequency of religious attendance		
Once a week/2-3 times a month	43	12
Once a month/2-3 times a year	64	17
Hardly ever/never	270	72
Religion		
Catholic	143	38
Evangelical/Protestant	16	4
Other	16	4
None/Atheist/Agnostic	202	54
Lived one year or more outside of Chile	23	6
Type of high school attended		
Public	73	19
Private (subsidized)	140	37
Private (self-paid)	164	44

Table 2. Students' views about whether their university should train medical and midwifery students on abortion provision, N=309

	Total (n) %	Attends secular university		Degree Pursuit		
		No	Yes	Medicine-undecided specialty (Ref)	Medicine-gynecology specialty	Midwifery
Believes their university should provide abortion training to:						
Medical students in general	(216) 70%	54%	74%*	73%	80%	54%*
Medical students-gynecology specialty	(243) 79%	67%	82%*	76%	80%	83%
Midwifery students	(240) 78%	58%	83%*	75%	75%	87%*
None of the above	(16) 5%	21%	<1%*	7%	1%	7%

*p<.05, based on mixed effect logistic regression analyses accounting for clustering by university. There were 68 missing responses to the question on whether their university should provide abortion training to their students.

Table 3. Respondent attitudes, concerns and intentions to provide abortion-related services

		Attends secular university		Degree pursuit		
	Total	No	Yes	Medicine-undecided specialty –Ref.	Medicine-Gynecology specialty	Midwifery
Concerns about providing abortion services, n=377						
Overall concerns scale (1-5), alpha=.81, mean(SD)	2.01(0.8)	2.59(0.8)	1.84(0.8)*	1.92(0.8)	2.02(0.8)	2.19(0.9)
Percent strongly agree/agree:						
It is against my personal values	32	62	23*	28	31	39
I fear that I would have legal problems	23	33	20*	20	25	29
It is against my religious beliefs	18	42	11*	16	18	22
It is outside of my scope of practice	15	45	7*	14	8	25
I fear that my family or I may be harassed and/or threatened	10	11	10	11	9	10
I may be ostracized/discriminated by my colleagues	6	7	5	5	7	5
I fear of being rejected by my family or friends	7	8	7	6	9	7
Has at least one or more concern	50	76	42*	44	51	60
Moral views about abortion provision, n=344						
Overall moral views scale (1-5), alpha=0.85, mean (SD)	3.74(1.0)	2.92(1.0)	3.97(0.8)*	3.78(0.9)	3.84(0.9)	3.55(1.1)
Percent strongly agree/agree:						
The needs of a patient are more important than the beliefs of a clinician	77	51	84*	76	79	76
Abortion should be covered as part of public health services	61	30	70*	63	68	51
Providing abortions is a positive contribution to society	57	26	66*	62	67	37
Clinicians have the responsibility to counsel patients against having an abortion-*R*	18	34	14*	15	18	26
I feel that providing abortions is morally wrong-*R*	16	35	10*	15	13	20
Intentions to provide abortion, n=377						
Overall intentions scale (1-4), scale alpha=.82, mean (SD)	2.79(0.8)	2.11(0.8)	2.99(0.6)*	2.85(0.8)	2.86(0.8)	2.61(0.8)
Percent strongly agree/agree:						
I plan to become trained to provide abortion services	69	38	78*	71	70	63
I would try to discourage a patient from seeking abortion-*R*	21	51	13*	16	24*	29
I will try to convince other doctors to provide abortions	21	8	25*	24	26	11*
I will not provide abortions under any circumstances-*R*	20	47	13*	18	14	31

Ref. =Referent group; SD=Standard deviation; *p<.05 based on unadjusted analyses; R. =Reverse coded.

Table 4. Factors associated with concerns and views about providing abortion-related services, according to multivariable regression analyses

	Has one or more concern about abortion provision			Has morally favorable views about abortion provision		
	%	aOR	95% CI	mean	Beta	[95% CI]
University type						
Secular	**42***	0.47	[0.23,0.95]	**3.97***	0.52	[0.32,0.72]
Religiously affiliated (Ref.)	76			2.92		
Gender						
Female	52.5	1.13	[0.65,1.95]	**3.78***	0.21	[0.05,0.37]
Male/Other (Ref.)	45.6			3.66		
Age group						
17-19	48	0.71	[0.34,1.48]	3.66	0.02	[-0.19,0.23]
20-24 (Ref)	51			3.80		
25-37	47	0.65	[0.28,1.49]	3.63	-0.22	[-0.46,0.01]
Degree pursuit						
Medicine-undecided specialty (Ref.)	44			3.78		
Medicine-Gynecology specialty	51	1.29	[0.71,2.33]	3.84	0.02	[-0.15,0.20]
Midwifery	60	1.16	[0.58,2.30]	3.55	-0.12	[-0.32,0.08]
Where completed high school						
Santiago metropolitan region	50	1.10	[0.62,1.93]	**3.77***	0.19	[0.02,0.36]
Other location (Ref.)	49			3.62		
Political affiliation						
Center/None (Ref.)	32			3.71		
Right/Center right	**81***	2.96	[1.42,6.19]	**2.88***	-0.52	[-0.72,-0.31]
Center left/left	52	0.61	[0.34,1.10]	**4.21***	0.23	[0.05,0.41]
Religion						
Catholic or other religion (Ref.)	71			3.26		
None	**31***	0.48	[0.26,0.89]	**3.20***	0.22	[0.03,0.41]
Frequency of religious attendance						
Hardly ever/never (Ref.)	39			4.04		
Once a month/2-3 times a year	71	1.85	[0.83,4.11]	3.30	-0.20	[-0.44,0.04]
Once a week/2-3 times a month	**88***	5.14	[1.73,15.26]	**2.53***	-0.91	[-1.16,-0.65]
Year in school						
1st-2nd (Ref.)	52			3.64		
3rd-4th	50	0.90	[0.45,1.79]	3.78	0.14	[-0.06,0.34]
5th-7th/just graduated	45	0.73	[0.31,1.73]	**3.88***	0.34	[0.09,0.58]
Type of high school attended						
Public (Ref.)	35.6			3.96		
Private-subsidized	52.2	1.90	[0.96,3.75]	3.87	-0.03	[-0.23,0.16]
Private-self-paid	54.3	0.95	[0.46,1.94]	3.53	0.05	[-0.16,0.25]

*p<.05; Ref. =Referent group; aOR: Adjusted odds ratios; CI: Confidence Intervals

Table 5. Factors associated with intentions to provide abortion-related services, according to multivariable linear and logistic regression analyses

	Intentions to provide abortion services scale			Plans to get trained to provide abortion services		
	mean	Beta	95% CI	%	aOR	95% CI
University type						
Secular	**2.99***	0.47	[0.31,0.63]	**78***	2.74	[1.38,5.43]
Religiously affiliated (Reference)	2.11			38		
Gender						
Female	2.80	0.09	[-0.04,0.21]	70	1.64	[0.88,3.05]
Male/Other (Reference)	2.78			66		
Age group						
17-19	2.75	0.05	[-0.11,0.22]	67	1.30	[0.59,2.88]
20-24 (Ref)	2.87			73		
25-37	**2.58***	-0.29	[-0.47,-0.10]	**53***	0.35	[0.14,0.87]
Degree pursuit						
Medicine-undecided specialty (Reference)	2.85			71		
Medicine-Gynecology specialty	2.86	-0.01	[-0.15,0.12]	70	0.96	[0.48,1.90]
Midwifery	2.61	-0.10	[-0.26,0.06]	63	0.80	[0.36,1.79]
Where completed high school						
Santiago metropolitan region	2.80	0.06	[-0.06,0.19]	69	1.14	[0.61,2.16]
Other location (Reference)	2.77			67		
Political affiliation						
Center/None (Reference)	2.77			68		
Right/Center right	**2.10***	-0.42	[-0.58,-0.26]	**37***	0.45	[0.22,0.90]
Center left/left	**3.20**	0.20	[0.06,0.34]	**87***	2.22	[1.01,4.07]
Religion						
Catholic or other religion (Reference)	2.39			51		
None	**3.14***	0.24	[0.09,0.39]	84	1.49	[0.74,3.01]
Frequency of religious attendance						
Hardly ever/never (Reference)	3.03			80		
Once a month/2-3 times a year	2.43	-0.13	[-0.31,0.06]	50	0.49	[0.21,1.12]
Once a week/2-3 times a month	**1.88***	-0.60	[-0.80,-0.40]	**26***	0.16	[0.06,0.41]
Year in school						
1st-2nd year (Reference)	2.71			65		
3rd-4th year	**2.90***	0.17	[0.02,0.33]	**76***	2.48	[1.09,5.28]
5th-7th year/just graduated	**2.81***	0.26	[0.06,0.46]	64	2.18	[0.78,6.13]
Type of high school attended						
Public (Reference)	2.95			84		
Private-subsidized	2.88	0.00	[-0.15,0.15]	**70***	0.37	[0.13,0.82]
Private-self-paid	2.65	0.12	[-0.04,0.27]	61	0.64	[0.26,1.55]

*p<.05; aOR: Adjusted odds ratios; CI: Confidence Intervals

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-5
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	5
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*6-7*
Bias	9	Describe any efforts to address potential sources of bias	8
Study size	10	Explain how the study size was arrived at	4-5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	none
		(*c*) Explain how missing data were addressed	8
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	7
		(*e*) Describe any sensitivity analyses	none

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	8
		(c) Consider use of a flow diagram	none
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	8
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	*6*
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	7-10, 15-17
		(*b*) Report category boundaries when continuous variables were categorized	6-7
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	10
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	12
Generalisability	21	Discuss the generalisability (external validity) of the study results	12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	1

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

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Future women's health providers' willingness to provide abortion services following decriminalization of abortion in Chile: a cross-sectional survey

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Title: Future women's health providers' willingness to provide abortion services following decriminalization of abortion in Chile: a cross-sectional survey

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Conflicts of interest: All authors state they have no financial conflicts of interest.

Data availability statement: De-identified data will be made available upon reasonable request.

Abstract

Objective: To assess Chilean medical and midwifery students' attitudes and willingness to become trained to provide abortion care, shortly after abortion was decriminalized in 2017.

Design: We fielded a cross-sectional, web-based survey of medical and midwifery students. We used generalized estimating equations to assess differences by type of university and degree sought.

Setting: We recruited students from a combination of seven secular, religiously-affiliated, public and private universities that offer midwifery or medical degrees with a specialization in obstetrics and gynecology, located in Santiago, Chile.

Participants: Students seeking medical or midwifery degrees at one of seven universities were eligible to participate. We distributed the survey link to medical and midwifery students at these seven universities; 459 eligible students opened the survey link and 377 students completed the survey.

Primary and secondary outcomes: Intentions to become trained to provide abortion services was our primary outcome of interest. Secondary outcomes included moral views and concerns about abortion provision.

Results: Most students intend to become trained to provide abortion services (69%), 20% reported that they will not provide an abortion under any circumstance, half (50%) had one or more concern about abortion provision and 16% agreed that providing abortions is morally wrong. Most believed that their university should train medical and midwifery students to provide abortion services (70%-78%). Secular university students reported higher intentions to provide abortion services (Beta 0.47, 95% Confidence Interval (CI): 0.31, 0.63), more favorable views (Beta 0.52, CI: 0.32, 0.72), and fewer concerns about abortion provision (aOR 0.47, CI: 0.23, 0.95) than students from religious universities.

Conclusion: Medical and midwifery students are interested in receiving training and providing abortion services, and believe their university should provide this training. Integrating high quality training in

abortion care into medical and midwifery programs will be critical to ensuring that women receive timely, nonjudgmental and quality abortion care.

Strengths and limitations of this study

- This is the first study to assess Chilean medical and midwifery students' willingness and concerns about providing abortion services soon after Chile lifted its complete ban on abortion.
- This study recruited students from a range of universities including secular, religious, public and private universities.
- This study includes important explanatory variables including political affiliation, religion, frequency of attendance at religious services and year in medical or midwifery school allowing us to identify whether any of these variables are associated with our outcomes.
- Our response rate was low and students from religious universities were underrepresented raising some concerns of response bias.
- We did not ask students under what circumstances would they consider providing abortion services, whether they were aware about the change in the law, or the circumstances in which abortion has currently been decriminalized.

Introduction

In August 2017, Chile's constitutional tribunal approved allowing abortion when the woman's life is in danger, lethal fetal anomaly, and for pregnancies due to rape. In the 1990s, when abortion was completely banned, abortion providers consisted of a mix of trained and untrained providers, many of whom had low levels of education and literacy, resulting in high rates of maternal mortality due to abortion.[1] During that period, health care providers reported a fear of prosecution when treating women with fetal or maternal complications,[2] and health care providers and hospitals filed the majority of cases against women who had abortions.[3] Since the 1990s to early 2000s, maternal mortality due to abortion has decreased considerably,[4] owing to increased access to contraception, misoprostol, and higher quality post-abortion care.[2 5]

Under the current law, only physicians are authorized to provide abortions and any individual directly involved in the abortion procedure and institutions are permitted to claim conscientious objection refusals. However, objecting providers are required to refer women interested in abortion to a willing provider and to care for women with post-abortion complications. It is legally required that all women seeking abortion be given oral and written information about alternatives to abortion, information about social and financial support programs, and be offered accompaniment (psychological and emotional support) services, before and after the abortion.[6] Soon after legal reform, the Ministry of Health provided resources to clinicians informing them about the requirements around conscientious objection, as well as guidelines around how to provide psychological and emotional support to women seeking abortion.[7] The Ministry of Health also provided a brief list of clinical fetal and maternal indications that allow a woman to obtain an abortion on maternal and fetal health grounds. While the Ministry of Health has provided abortion training to providers throughout the country, it has not disseminated any specific clinical guidelines around abortion provision. Since the first full year of implementation of the law, there have been over 600 legal abortions in the country, the greatest

proportion of which are for maternal indications (45%), followed by fetal conditions (40%), and rape (15%).[6 8]

A few studies have examined future providers' attitudes and willingness to provide abortion in places where abortion has recently been liberalized or abortion is highly restricted. In Ghana, a survey of final year midwifery students found that, following abortion liberalization, the majority (70%) reported that they were somewhat or very likely to provide abortion services once they had graduated.[9] The most common reasons for being unwilling to provide services were personal and religious beliefs. Shortly after legal reform in Colombia, a majority of medical students (>90%) surveyed supported abortion decriminalization under the current law, yet few felt prepared to offer abortion care.[10] Similarly in Ethiopia, a survey of female higher education students, found that only a minority were aware of the circumstances in which abortion had been recently legalized.[11] In India, medical students also reported a lack of knowledge about and fear of providing abortion services.[12]

Legal reform introduces a new challenge and opportunity for prospective women's health providers. They must now consider whether or not they are willing to develop their skills in order to fill a critical service gap, in an environment that lacks experienced clinicians and has limited capacity to provide abortion services. The extent to which future providers welcome, reject, and/or are concerned about providing abortion-related care, now that abortion is legally permissible in Chile, is unclear. This study aims to deepen our understanding of medical and midwifery students' attitudes, concerns, and willingness to provide abortion-related care, a critical step in identifying the country's future abortion training needs.

Materials and Methods

Study design

We conducted a cross-sectional survey of prospective women's health providers seeking medical or midwifery degrees at universities located in the metropolitan region of Santiago, Chile's

capital. We powered our sample to detect mean differences in abortion attitudes by university type (secular vs religious university) and degree type (medical vs midwifery). We estimated that a sample of 300, with a minimum group size of 90, could detect a mean difference of 0.45, on a 4-point scale, and as reported in a published abortion stigma subscale, with a standard deviation of 1.07, and a two-sided alpha of 5% and 80% power.[13]

Recruitment procedures

We selected a combination of seven secular, religiously-affiliated, public and private universities that offer midwifery or medical degrees with a specialization in obstetrics and gynecology, located in Santiago, Chile, to serve as recruitment sites. This included seven medical and five midwifery departments within these seven universities. In Chile, a degree in medicine usually requires seven years of study; midwifery programs are typically five-year programs that train students in obstetrics, perinatal health, and neonatology. Midwifery programs are usually located within a university's school of medicine, nursing, or health sciences, but midwifery is considered a completely separate career from medicine or nursing. Based on a review of the Ministry of Education and university websites, we estimated that the seven participating universities serve over 7,000 students seeking medical or midwifery degrees, representing 72% of medical and 38% of midwifery students in the metropolitan region of Santiago and 36% of medical and 16% of midwifery students in the country.[14] Among the 7026 medical and midwifery students in our student pool at these seven universities, 65% are at secular universities, 35% are at religiously-affiliated universities, 80% are medical students, and 20% are midwifery students.

We requested department administrators and student leaders to distribute a survey link to their medical and midwifery students. Six departments at four universities shared the link with students directly, through student listservs or department Facebook pages. At the two non-responding universities, we distributed paper flyers that included the survey link and a QR code to medical and

midwifery students. Interested participants were entered into a gift card drawing (worth $40 USD/24,000 Chilean pesos) of 25 randomly-selected winners. The study protocol received ethical approval from the University of Diego Portales, Santiago, Chile.

Survey administration

We fielded a web-based, anonymous survey from October 2017 to May 2018. Students seeking a medical or midwifery degree at one of the seven identified universities were eligible to participate. Interested students reviewed an online consent form, consented, and completed the survey. The survey assessed students' moral views,[15] intentions,[16] and concerns about providing abortion.[17] We drew items from the published literature,[15-17] and adapted them to be applicable to university students and in a context in which provision of abortion had not been previously legal. The final survey tool was then pilot tested with six students, before distributing it to the full sample.

Patient and public involvement

Prior to developing the student survey, we conducted 30 in-depth qualitative in-person interviews with clinical teaching faculty at the same seven universities where we intended to survey students, and within the schools' OB/GYN and midwifery departments. Findings from the faculty interviews, informed the development of the research questions and the development of the student survey. Before finalizing the survey, we shared an initial draft of survey items with faculty members teaching in the fields of obstetrics, medical ethics, and midwifery, and with the study team for review and comment. We have presented a summary of the findings from faculty and students at several medical and midwifery schools and among reproductive health professionals in Chile, and plan to continue presenting the results at professional conferences. We did not include patient involvement in the design of this study.

Outcome variables

Drawing from the literature of abortion attitudes and intentions to provide abortion, we identified three abortion-provision domains. We examined five outcomes related to three abortion-provision domains. We tested the internal consistency reliability of each domain and confirmed that each of the three domains produced acceptable Cronbach's alpha scores. We derived the concerns about abortion provision items from a US survey of students enrolled in a health sciences program (i.e. medicine, nursing, etc.).[17] Items included: "Now that abortion is legal in certain circumstances, to what extent do the following factors related to abortion provision concern you?" Followed by seven, Likert-scaled (1-strongly disagree to 5-strongly agree) items: "It is against my personal values", "I fear that I would have legal problems", "It is against my religious beliefs", "It is outside my scope of practice", "I fear that either I or my family may be harassed and/or threatened by others", "I may be ostracized by my colleagues and/or discriminated against in my profession", and "I fear being rejected by my family or friends". Average scores across items served as our continuous *concerns about abortion provision* outcome. *Having one or more concern* served as a dichotomous outcome which included anyone who agreed or strongly agreed with any of these seven items. We adapted moral views about abortion provision items from a survey instrument developed among clinicians in Ghana.[18] Items included respondents' level of agreement (1-strongly disagree to 5-strongly agree) with five items: "The needs of a patient are more important than the beliefs of a clinician", "Abortion should be covered as part of public health services", "Providing abortions is a positive contribution to society", "Clinicians have a responsibility to counsel patients against having an abortion" and "I feel that providing abortions is morally wrong". After reverse coding the latter two items, average scores across items served as a continuous *morally favorable views about abortion provision* outcome. For intentions to provide abortion services items were derived from a survey developed for use among medical students in South Africa.[16] Participants were asked "Now that abortion is legal in some circumstances, how do you think this will affect your future practice?", and to indicate their level of agreement (1-strongly disagree to 4-

strongly agree) with four items: “I intend to become trained to provide abortion services”, “I will try to convince other doctors to provide abortions”, “If a female patient requested an abortion, I would try to discourage her from seeking the procedure”, and “I will not provide an abortion under any circumstance.” After reverse coding the latter two items, average scores served as one continuous outcome. Endorsement (agreed/strongly agreed) of *I plan to become trained to provide abortion services* served as final dichotomous outcome.

Independent variables

Independent variables included university type (secular or religious), gender, age group, degree type (medicine-undecided specialty, medicine-obstetrics and gynecology specialty, and midwifery), political affiliation (none/center, right/center right, and left/center left), religion (Catholic or other religion vs none/atheist/agnostic), frequency of attendance to religions services, year in medical/midwifery school, region where student completed high school (Santiago vs other), and as a proxy for socioeconomic status, type of high school attended (public, private-subsidized, and private-self-paid).

Analyses

We estimated frequencies for participant and university characteristics (Table 1) and each abortion provision domain. We present students' views about whether their university should train medical and midwifery students on abortion provision in Table 2 and internal consistency Cronbach’s alpha reliability coefficients for each outcome domain in Table 3. For multivariable models, we used linear and logistic general estimating equation (GEE) models accounting for clustering by university (Tables 4 and 5). To test associations between participant characteristics and our main outcomes, we selected model covariates known to be associated with abortion attitudes, based on the existing literature.[19] We conducted all analyses in STATA 14. Significance was reported at $P \leq .05$.

Results

Respondent characteristics

The survey link was distributed to 2,148 medical and midwifery students and 459 opened the survey link; we removed 46 surveys due to ineligibility, and 36 surveys that were less than 40% complete or were missing outcome data, leaving a final sample of 377 and a response rate of (18%, 377/2,148). There were no statistically significant differences by gender, religion, age, year in school, university type, type of degree being pursued, or political affiliation between our final sample (n=377) and those with incomplete surveys (n=36). We describe student and university characteristics in Table 1. Most students attended a secular university (77%), 63% a private university, and 75% were seeking a medical degree (49% undecided specialty and 26% with specialization in obstetrics and gynecology). Most students felt that their university should provide abortion training to all medical students (70%), medical students with an Ob/Gyn specialty (79%), and to midwifery students (78%, Table 2). After removing all observations with missing outcome data, there were no missing data for any of the independent variables of interest. However, there were 68 missing responses for the question asking students if their university should provide abortion training to their students.

Concerns, moral views and intentions to provide abortion-related services

Half (50%) of students agreed/strongly agreed that they had one or more concern about providing abortion-related services. Primary concerns included: providing abortion was against their personal values (32%) or religious beliefs (18%) and a fear of legal problems (23%, Table 3). Overall concerns about providing abortion-related services were significantly higher among students attending religious than those attending secular universities (mean 2.59 vs 1.84, $p<.05$), with no statistically significant differences by the type of degree being pursued.

Over three-quarters (77%) of students agreed/strongly agreed that the needs of a patient are more important than the beliefs of a clinician, 61% agreed that abortion should be covered as part of public health services, 57% agreed that providing abortions is a positive contribution to society, and 16%

agreed that providing abortions is morally wrong (Table 3). Students from secular universities were significantly more likely to hold morally favorable views about abortion provision than students from religious universities (mean 3.97 vs 2.92, p<.05), with no statistically significant differences by type of degree being pursued.

Nearly two-thirds (69%) of students agreed/strongly agreed that they plan to become trained to provide abortion services but only 21% would try to convince other doctors to provide abortion services. Approximately one in five students agreed that they would discourage a woman from seeking an abortion (21%) and that they will not provide an abortion under any circumstance (20%). Students from secular universities had significantly higher overall intentions to provide abortion-related services than students from religious universities (mean 2.99 vs. 2.11, p<.05). Medical students specializing in obstetrics and gynecology (24%) were significantly (p<.05) more likely than medical students who had not yet decided on their specialty (10%) to agree they would try to discourage a patient from seeking an abortion. Midwifery students (11%) were less likely than medical students (24%) to say they would try to convince other doctors to provide abortions.

In multivariable analyses, factors associated with having one or more concern about abortion provision included having a right/center right political affiliation (aOR 2.96, CI: 1.42, 6.19) and attending religious services frequently (aOR 5.14, CI: 1.73, 15.26, Table 4). Factors associated with lower odds of having concerns about abortion provision included attending a secular university (aOR 0.47, CI: 0.23, 0.95) and identifying as atheist, agnostic or of no religion (aOR 0.47, CI: 0.23, 0.95).

Factors associated with having morally favorable views about abortion provision included attending a secular university (Beta 0.52, CI: 0.32, 0.72), being female (Beta 0.21, CI: 0.05, 0.37), having completed their high school education in Santiago (Beta 0.19, CI: 0.02, 0.36), identifying as left/center left political affiliation (Beta 0.23, CI: 0.05, 0.41), and being in the last few years of medical/midwifery school (Beta 0.34, CI: 0.09, 0.58, Table 4). Those who identified as right/center right political affiliation

(Beta -0.52, CI: -0.72, -0.31) or attended religious services frequently (Beta -0.91, CI: -1.16, -0.65) were less likely to hold morally favorable views about abortion provision.

Factors associated with overall intentions to provide abortion services and specifically having plans to get trained to provide abortion services included attending a secular university (Beta 0.47, CI: 0.31, 0.63 and aOR 2.74, CI: 1.38, 5.43, respectively), having a left/center left political affiliation (Beta 0.20, CI: 0.06, 0.34 and aOR 2.22, CI: 1.01, 4.07), and being in the 3rd or 4th year in medical/midwifery school (Beta 0.17, CI: 0.02, 0.33 and aOR 2.48, CI: 1.09, 5.28, Table 5). Identifying as atheist, agnostic or of no religion was associated with higher overall intentions to provide abortion services (Beta 0.24, CI: 0.09, 0.39). Factors associated with fewer overall intentions and plans to become trained to provide abortion services included being ages 25 and older (Beta -0.29, CI: -0.47, -0.10 and aOR 0.35, CI: 0.14, 0.87), having a right/center right political affiliation (Beta -0.42, CI: -0.58, -0.26 and aOR 0.45, CI: 0.22, 0.90), and attending religious services frequently (Beta -0.60, CI: -0.80, -0.40 and aOR 0.16, CI: 0.06, 0.41).

Discussion

Findings from this study highlight widespread support among prospective women's health clinicians to build a qualified workforce to provide abortion services under the current law in Chile. The vast majority of secular and over one-third of religiously-affiliated university students have intentions to become trained to provide abortion services. Moreover, only one in ten secular university students and less than half of students at religiously-affiliated universities said they will not provide abortion services under any circumstance. Most students, even those at religious universities, felt that they should receive abortion-related training and moral opposition to abortion was low. Religious university students' desire to receive abortion training is in conflict with the position that some religious universities have taken—to claim institutional-level refusals to provide abortion care at their hospitals.[20 21]

More than half (57%) of students believe providing abortion services is a positive contribution to society and few (16%) thought that providing abortions is morally wrong. Holding morally favorable views about abortion provision was higher among students who were further along in their medical and midwifery training suggesting that experience may impact students' willingness to provide such services. Studies in Poland, Ghana and South Africa, similarly have found that medical and midwifery students' in their later years of study had more favorable attitudes about abortion, abortion provision, and were more willing to provide abortion services, than students in the first few years of study.[9 16 22] Study participants' views and intentions to become trained to provide abortion services are likely to change even further once they become practicing clinicians, as organizational barriers and stigma may deter interested clinicians from abortion provision.[23 24]

Along with the high level of support and intentions to become trained to provide abortion services, over half of students held concerns, mainly related to their personal values and religious beliefs, but also due to a fear of legal problems and of being harassed or threatened. These concerns may be well-founded, as evidenced by the public defaming of the physician who performed the first legal abortion in the country.[25] Furthermore, the broad adoption of conscientious objector status among clinicians and institutions[26] may be a product of and/or contributor to the stigma of being an abortion provider. Clinicians in Chile may require extensive support professionally in order to ensure that they feel safe providing abortion services to women. Access to training programs to reduce provider stigma around abortion, as well as burnout, such as that offered by the Provider Share Workshop, are one example of how a future abortion care workforce could be supported.[27]

Consistent with numerous studies documenting the relationship between political views, religiosity and abortion attitudes among medical students, clinicians, and the general public,[28-30] we found that students' political affiliation and frequency of religious attendance was strongly associated with students' moral views and willingness to become trained to provide abortion services. Students'

religious beliefs are likely to influence their clinical opinions and interactions, and thus they may benefit from training to ensure that they are able to provide nonjudgmental services. Studies in the United States have found that Ob/Gyn residents who were morally opposed to abortion but partially participated in an abortion training program, felt they gained important clinical and professional skills from the abortion training.[31 32]

While there was widespread interest in learning to provide abortion-related services among medical and midwifery students attending Catholic-affiliated institutions, it is unlikely that these institutions will ever train their students to provide abortion procedures. Furthermore, while most midwifery students reported interest in becoming trained to provide abortion care, they currently are prohibited from performing procedures. However, there is a wide range of abortion-related information and skills that arguably should be offered as part of any medical or midwifery student curriculum, irrespective of their religious affiliation or prohibition on abortion provision. Medical and midwifery schools could train students to give accurate, informed and non-judgmental pregnancy options counseling, and referrals for abortion care,[33] to provide high quality post-abortion care, including managing complications and miscarriage management,[34] to develop competencies on how to address specific patient scenarios related to abortion care, and to offer offsite residency abortion training programs. The extent to which medical and midwifery programs in Chile are planning to offer abortion training, if at all, and whether they will require their students to participate at some level, is still unclear.

This study had a number of limitations. Our response rate was low, a common characteristic of web-based surveys and surveys on sensitive topics.[35] Thus, our findings may suffer from response bias. While this study successfully reached students from secular and religious universities, students from religious universities were somewhat underrepresented. According to the Ministry of Education, approximately 35% of the medical and midwifery population within our seven university recruitment sites are at religiously-affiliated universities, whereas less than one-quarter (23%) of our responding

sample came from religiously-affiliated universities.[14] Thus, the views presented here are likely more supportive of abortion than medical and midwifery students across the country. The lack of statistically significant differences between participant characteristics and rates of survey completion mitigates some of these concerns. Furthermore, the significant associations between variables should not be affected by nonresponse bias. Nonetheless, students' attitudes about abortion provision are similar to those reported among obstetricians and gynecologists in Argentina,[36] a country that also has very restrictive abortion laws. Another study limitation lies in that we did not ask students under which of the three legal grounds they would consider providing abortion services, or whether they were aware about the change in the law, or the circumstances in which abortion has currently been decriminalized. Just one year after legal implementation, we find that OB/GYN providers working in public hospitals, are claiming conscientious objection status to refuse to provide abortion specifically by reason (woman's health in danger, pregnancy result of rape, or fetal malformation); reasons that were not explored in this study.[37]

Conclusions

This is the first study to assess Chilean medical and midwifery student's willingness to provide abortion services following legal reform. Students are interested in receiving training and providing abortion care to women and believe their university should provide this training. Ensuring that high quality training in abortion care is integrated within medical and midwifery programs will be critical to ensuring that women receive timely, nonjudgmental and quality abortion care.

Table 1. Participant characteristics (N=377)

	N	%
Gender		
Female	239	64
Male	136	36
Other	1	<1
Age group		
17-19	95	25
20-24	222	59
25-37	60	16
Attends secular university	292	77
Attends private university	262	63
Degree pursuit		
Midwifery/Obstetrics	94	25
Medicine-Undecided specialty	186	49
Medicine-Gynecology specialty	97	26
University year		
1st-2nd	163	43
3rd-4th	127	34
5th-6th	47	12
Last year/Just graduated	40	11
Born in Chile	368	98
Region where graduated high school		
Santiago metropolitan region	285	76
Northern Chile	34	9
Southern Chile	54	14
Other country	4	1
Not married	369	98
Political affiliation		
Right/Center right	95	25
Center	32	8
Center left/left	171	45
None	79	21
Frequency of religious attendance		
Once a week/2-3 times a month	43	12
Once a month/2-3 times a year	64	17
Hardly ever/never	270	72
Religion		
Catholic	143	38
Evangelical/Protestant	16	4
Other	16	4
None/Atheist/Agnostic	202	54
Lived one year or more outside of Chile	23	6
Type of high school attended		
Public	73	19
Private (subsidized)	140	37
Private (self-paid)	164	44

Table 2. Students' views about whether their university should train medical and midwifery students on abortion provision, N=309

	Total (n) %	Attends secular university		Degree Pursuit		
		No	Yes	Medicine-undecided specialty (Ref)	Medicine-gynecology specialty	Midwifery
Believes their university should provide abortion training to:						
Medical students in general	(216) 70%	54%	74%*	73%	80%	54%*
Medical students-gynecology specialty	(243) 79%	67%	82%*	76%	80%	83%
Midwifery students	(240) 78%	58%	83%*	75%	75%	87%*
None of the above	(16) 5%	21%	<1%*	7%	1%	7%

*p<.05, based on mixed effect logistic regression analyses accounting for clustering by university. There were 68 missing responses to the question on whether their university should provide abortion training to their students.

Table 3. Respondent attitudes, concerns and intentions to become trained to provide abortion services

		Attends secular university		Degree pursuit		
	Total	No	Yes	Medicine-undecided specialty –Ref.	Medicine-Gynecology specialty	Midwifery
Concerns about providing abortion services, n=377						
Overall concerns scale (1-5), alpha=.81, mean(SD)	2.01(0.8)	2.59(0.8)	1.84(0.8)*	1.92(0.8)	2.02(0.8)	2.19(0.9)
Percent strongly agree/agree:						
It is against my personal values	32	62	23*	28	31	39
I fear that I would have legal problems	23	33	20*	20	25	29
It is against my religious beliefs	18	42	11*	16	18	22
It is outside of my scope of practice	15	45	7*	14	8	25
I fear that my family or I may be harassed and/or threatened	10	11	10	11	9	10
I may be ostracized/discriminated by my colleagues	6	7	5	5	7	5
I fear of being rejected by my family or friends	7	8	7	6	9	7
Has at least one or more concern	50	76	42*	44	51	60
Moral views about abortion provision, n=344						
Overall moral views scale (1-5), alpha=0.85, mean (SD)	3.74(1.0)	2.92(1.0)	3.97(0.8)*	3.78(0.9)	3.84(0.9)	3.55(1.1)
Percent strongly agree/agree:						
The needs of a patient are more important than the beliefs of a clinician	77	51	84*	76	79	76
Abortion should be covered as part of public health services	61	30	70*	63	68	51
Providing abortions is a positive contribution to society	57	26	66*	62	67	37
Clinicians have the responsibility to counsel patients against having an abortion-*R*	18	34	14*	15	18	26
I feel that providing abortions is morally wrong-*R*	16	35	10*	15	13	20
Intentions to become trained to provide abortion services, n=377						
Overall intentions scale (1-4), scale alpha=.82, mean (SD)	2.79(0.8)	2.11(0.8)	2.99(0.6)*	2.85(0.8)	2.86(0.8)	2.61(0.8)
Percent strongly agree/agree:						
I intend to become trained to provide abortion services	69	38	78*	71	70	63
I would try to discourage a patient from seeking abortion-*R*	21	51	13*	16	24*	29
I will try to convince other doctors to provide abortions	21	8	25*	24	26	11*
I will not provide abortions under any circumstances-*R*	20	47	13*	18	14	31

Ref. =Referent group; SD=Standard deviation; *p<.05 based on unadjusted analyses; R. =Reverse coded.

Table 4. Factors associated with concerns and moral views about providing abortion-related services, according to multivariable regression analyses

	Has one or more concern about abortion provision			Has morally favorable views about abortion provision		
	%	aOR	95% CI	mean	Beta	[95% CI]
University type						
Secular	**42***	0.47	[0.23,0.95]	**3.97***	0.52	[0.32,0.72]
Religiously affiliated (Ref.)	76			2.92		
Gender						
Female	52.5	1.13	[0.65,1.95]	**3.78***	0.21	[0.05,0.37]
Male/Other (Ref.)	45.6			3.66		
Age group						
17-19	48	0.71	[0.34,1.48]	3.66	0.02	[-0.19,0.23]
20-24 (Ref)	51			3.80		
25-37	47	0.65	[0.28,1.49]	3.63	-0.22	[-0.46,0.01]
Degree pursuit						
Medicine-undecided specialty (Ref.)	44			3.78		
Medicine-Gynecology specialty	51	1.29	[0.71,2.33]	3.84	0.02	[-0.15,0.20]
Midwifery	60	1.16	[0.58,2.30]	3.55	-0.12	[-0.32,0.08]
Where completed high school						
Santiago metropolitan region	50	1.10	[0.62,1.93]	**3.77***	0.19	[0.02,0.36]
Other location (Ref.)	49			3.62		
Political affiliation						
Center/None (Ref.)	32			3.71		
Right/Center right	**81***	2.96	[1.42,6.19]	**2.88***	-0.52	[-0.72,-0.31]
Center left/left	52	0.61	[0.34,1.10]	**4.21***	0.23	[0.05,0.41]
Religion						
Catholic or other religion (Ref.)	71			3.26		
None	**31***	0.48	[0.26,0.89]	**3.20***	0.22	[0.03,0.41]
Frequency of religious attendance						
Hardly ever/never (Ref.)	39			4.04		
Once a month/2-3 times a year	71	1.85	[0.83,4.11]	3.30	-0.20	[-0.44,0.04]
Once a week/2-3 times a month	**88***	5.14	[1.73,15.26]	**2.53***	-0.91	[-1.16,-0.65]
Year in school						
1st-2nd (Ref.)	52			3.64		
3rd-4th	50	0.90	[0.45,1.79]	3.78	0.14	[-0.06,0.34]
5th-7th/just graduated	45	0.73	[0.31,1.73]	**3.88***	0.34	[0.09,0.58]
Type of high school attended						
Public (Ref.)	35.6			3.96		
Private-subsidized	52.2	1.90	[0.96,3.75]	3.87	-0.03	[-0.23,0.16]
Private-self-paid	54.3	0.95	[0.46,1.94]	3.53	0.05	[-0.16,0.25]

*p<.05; Ref. =Referent group; aOR: Adjusted odds ratios; CI: Confidence Intervals

Table 5. Factors associated with intentions to become trained to provide abortion services, according to multivariable linear and logistic regression analyses

	Intentions to provide abortion services scale			Intends to become trained to provide abortion services		
	mean	Beta	95% CI	%	aOR	95% CI
University type						
Secular	**2.99***	0.47	[0.31,0.63]	**78***	2.74	[1.38,5.43]
Religiously affiliated (Reference)	2.11			38		
Gender						
Female	2.80	0.09	[-0.04,0.21]	70	1.64	[0.88,3.05]
Male/Other (Reference)	2.78			66		
Age group						
17-19	2.75	0.05	[-0.11,0.22]	67	1.30	[0.59,2.88]
20-24 (Ref)	2.87			73		
25-37	**2.58***	-0.29	[-0.47,-0.10]	**53***	0.35	[0.14,0.87]
Degree pursuit						
Medicine-undecided specialty (Reference)	2.85			71		
Medicine-Gynecology specialty	2.86	-0.01	[-0.15,0.12]	70	0.96	[0.48,1.90]
Midwifery	2.61	-0.10	[-0.26,0.06]	63	0.80	[0.36,1.79]
Where completed high school						
Santiago metropolitan region	2.80	0.06	[-0.06,0.19]	69	1.14	[0.61,2.16]
Other location (Reference)	2.77			67		
Political affiliation						
Center/None (Reference)	2.77			68		
Right/Center right	**2.10***	-0.42	[-0.58,-0.26]	**37***	0.45	[0.22,0.90]
Center left/left	**3.20**	0.20	[0.06,0.34]	**87***	2.22	[1.01,4.07]
Religion						
Catholic or other religion (Reference)	2.39			51		
None	**3.14***	0.24	[0.09,0.39]	84	1.49	[0.74,3.01]
Frequency of religious attendance						
Hardly ever/never (Reference)	3.03			80		
Once a month/2-3 times a year	2.43	-0.13	[-0.31,0.06]	50	0.49	[0.21,1.12]
Once a week/2-3 times a month	**1.88***	-0.60	[-0.80,-0.40]	**26***	0.16	[0.06,0.41]
Year in school						
1st-2nd year (Reference)	2.71			65		
3rd-4th year	**2.90***	0.17	[0.02,0.33]	**76***	2.48	[1.09,5.28]
5th-7th year/just graduated	**2.81***	0.26	[0.06,0.46]	64	2.18	[0.78,6.13]
Type of high school attended						
Public (Reference)	2.95			84		
Private-subsidized	2.88	0.00	[-0.15,0.15]	**70***	0.37	[0.13,0.82]
Private-self-paid	2.65	0.12	[-0.04,0.27]	61	0.64	[0.26,1.55]

*p<.05; aOR: Adjusted odds ratios; CI: Confidence Intervals

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STROBE Statement—checklist of items that should be included in reports of observational studies

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	1
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	3
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	4
Objectives	3	State specific objectives, including any prespecified hypotheses	4
Methods			
Study design	4	Present key elements of study design early in the paper	4
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	4-5
Participants	6	(*a*) *Cohort study*—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up *Case-control study*—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls *Cross-sectional study*—Give the eligibility criteria, and the sources and methods of selection of participants	5
		(*b*) *Cohort study*—For matched studies, give matching criteria and number of exposed and unexposed *Case-control study*—For matched studies, give matching criteria and the number of controls per case	
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	6-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	*6-7*
Bias	9	Describe any efforts to address potential sources of bias	8
Study size	10	Explain how the study size was arrived at	4-5
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	7
		(*b*) Describe any methods used to examine subgroups and interactions	none
		(*c*) Explain how missing data were addressed	8
		(*d*) *Cohort study*—If applicable, explain how loss to follow-up was addressed *Case-control study*—If applicable, explain how matching of cases and controls was addressed *Cross-sectional study*—If applicable, describe analytical methods taking account of sampling strategy	7
		(*e*) Describe any sensitivity analyses	none

Continued on next page

Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	8
		(b) Give reasons for non-participation at each stage	8
		(c) Consider use of a flow diagram	none
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	8
		(b) Indicate number of participants with missing data for each variable of interest	8
		(c) *Cohort study*—Summarise follow-up time (eg, average and total amount)	
Outcome data	15*	*Cohort study*—Report numbers of outcome events or summary measures over time	
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	
		Cross-sectional study—Report numbers of outcome events or summary measures	*6*
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	7-10, 15-17
		(*b*) Report category boundaries when continuous variables were categorized	6-7
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A
Discussion			
Key results	18	Summarise key results with reference to study objectives	10
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	12
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	12
Generalisability	21	Discuss the generalisability (external validity) of the study results	12
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	1

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.