

Abortion restrictions and medical residency applications

Kellen Mermin-Bunnell ¹, Ariana M Traub,¹ Kelly Wang,² Bryan Aaron,³ Louise Perkins King,^{4,5} Jennifer Kawwass⁶

► Additional supplemental material is published online only. To view, please visit the journal online (<http://dx.doi.org/10.1136/jme-2023-109190>).

¹Emory University School of Medicine, Atlanta, Georgia, USA

²Department of Population Health Science and Policy, Icahn School of Medicine at Mount Sinai, New York, New York, USA

³University of Michigan Medical School, Ann Arbor, Michigan, USA

⁴Department of Obstetrics and Gynecology, Harvard Medical School, Boston, Massachusetts, USA

⁵Department of Obstetrics and Gynecology, Brigham and Women's Hospital, Boston, Massachusetts, USA

⁶Department of Gynecology and Obstetrics, Emory University School of Medicine, Atlanta, Georgia, USA

Correspondence to

Ms. Kellen Mermin-Bunnell, Emory University School of Medicine, Atlanta, GA 30322, USA; kmermin@emory.edu

KM-B and AMT contributed equally.

KM-B and AMT are joint first authors.

Received 17 April 2023

Accepted 28 October 2023

ABSTRACT

Residency selection is a challenging process for medical students, one further complicated in the USA by the recent *Dobbs v Jackson Women's Health Organization (Dobbs)* decision over-ruling the federal right to abortion. We surveyed medical students to examine how *Dobbs* is influencing the ideological, personal and professional factors they must reconcile when choosing where and how to complete residency.

Between 6 August and 22 October 2022, third-year and fourth-year US medical students applying to US residency programmes were surveyed through social media and direct outreach to medical schools. Analysis of quantitative and qualitative data from 494 responses was performed to assess downstream effects of *Dobbs* on residency applicants' family, health and career choices.

Most respondents said changes in abortion access would likely or very likely influence their decision regarding location of considered residency programme (76.9%), where to start a family (72.2%) and contraceptive planning for them or their partner (57.9%). Cis-gender females were more influenced by *Dobbs* regarding where (5 (4, 5) $p < 0.001$) and when (3 (3, 5) $p < 0.001$) to start a family. In qualitative responses, medical trainees highlighted the importance of abortion access for their patients, themselves and their loved ones.

Medical trainees are incorporating state abortion access into their residency programme choices. Future physicians care about both the quality of care they will be able to provide and their own health. For personal and professional reasons, reproductive healthcare access is now a key factor in residency match decisions.

INTRODUCTION

Residency decisions have long been challenging for medical students and have been further complicated by the US Supreme Court's *Dobbs v Jackson Women's Health Organization (Dobbs)* ruling. The majority in *Dobbs* over-ruled prior case law recognising a constitutional right to privacy that included making decisions about abortion care. Since the ruling, state legislation regarding access to reproductive healthcare has been in flux.¹ The changing political and healthcare landscape in the USA has impacted healthcare systems across the country as physicians grapple to understand the medical and educational repercussions of new laws. Residency applicants must now consider access to comprehensive medical education and reproductive health services for themselves and their patients in programme selection.

Medical students typically consider work-life balance, geographic location, reputation of programme, quality of residents in the programme, the strength of their own application and goodness of

fit when choosing residency programmes,² demonstrating that professional and personal factors contribute to this decision. Rates of burnout and moral injury-driven mental illness among physicians, particularly depression and suicide, are thrice that of the general population, and one in five physicians plan to leave clinical practice in the next 3 years.^{3–5} This is a concern for residency applicants hoping to build sustainable careers.^{6,7} State healthcare laws, including access to abortion, modulate both.

Reproductive healthcare and family planning are increasingly important for residents: in 2011, 47.1% of medical school matriculants were women; by 2022, 52.7% of matriculants were women.⁸ Pregnancy-related stigma, unmodified work schedules during pregnancy, short parental leave options post partum and minimal childcare support all contribute to physicians postponing pregnancy until after training,^{9–11} which confers increased risks of infertility and pregnancy complications associated with older ages during pregnancy.^{12,13} When physicians do become pregnant, they have higher age-adjusted rates of infertility and pregnancy complications, and surgeons have more than doubled the miscarriage rate of the general population.¹⁴ These risks factor into decisions physicians may make about becoming pregnant and continuing a pregnancy. Thus, under *Dobbs*, concerns for their own reproductive care and the health of their families, as well as the ability to provide reproductive care to others, may contribute to where medical students choose to train.

The rights to privacy and autonomy over personal reproductive decisions have been recognised under *Roe v Wade* since 1973. The loss of this previously recognised constitutional right has further complicated medical students' personal and professional considerations regarding their pursuit of further medical training. We surveyed third-year and fourth-year medical students to assess *Dobbs*'s impact on the 2022–2023 residency application cycle, and the personal and ideological factors trainees must reconcile as they choose where and how to continue their path towards becoming practising physicians.

METHODS

Study design and population

Between 6 August and 22 October 2022, a Qualtrics survey was administered to third-year and fourth-year US medical students applying into US residency programmes. Consent was obtained via respondents' acknowledgement of their participation in the study, in which



© Author(s) (or their employer(s)) 2023. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Mermin-Bunnell K, Traub AM, Wang K, *et al*. *J Med Ethics* Epub ahead of print: [please include Day Month Year]. doi:10.1136/jme-2023-109190

Table 1 Demographic, residency selection, graduation year and abortion access characteristics among third-year and fourth-year medical students, August to October 2022

| Demographics | n (%) |
|--|------------|
| Total | 494 |
| Age, years | |
| 20–25 | 179 (36.2) |
| 26–30 | 270 (54.7) |
| 31–35 | 32 (6.2) |
| 36–40 | 9 (1.8) |
| >40 | 4 (0.8) |
| Gender | |
| Cis-gender female | 338 (68.4) |
| Cis-gender male | 130 (26.3) |
| Other | 18 (3.6) |
| Prefer not to say | 8 (1.6) |
| Race | |
| White | 311 (63.0) |
| Black or African American | 22 (4.5) |
| Asian | 69 (14.0) |
| Mixed race | 36 (7.3) |
| Other | 16 (3.2) |
| Prefer not to say | 13 (2.6) |
| Partnership status | |
| Married/partnered/in a relationship | 317 (64.2) |
| Single | 172 (34.8) |
| Other | 2 (0.4) |
| Prefer not to say | 3 (0.6) |
| Religion | |
| Atheist | 109 (22.1) |
| Agnostic | 137 (27.7) |
| Roman Catholic | 48 (9.7) |
| Other denominations of Christianity | 92 (18.6) |
| Judaism | 38 (7.7) |
| Hindu | 16 (3.2) |
| Muslim | 7 (1.4) |
| Other | 23 (4.7) |
| Prefer not to say | 24 (4.9) |
| Sexual orientation | |
| Straight/heterosexual | 370 (70.9) |
| Bisexual/pansexual | 79 (16.0) |
| Gay/lesbian/queer | 34 (6.9) |
| Other | 14 (2.8) |
| Prefer not to say | 17 (3.4) |
| Are you applying into Ob-Gyn for residency? | |
| No | 289 (58.5) |
| Yes | 107 (21.7) |
| Unsure | 98 (19.8) |
| Expected medical school graduation year | |
| 2023 | 207 (41.9) |
| 2024 | 221 (44.7) |
| After 2024 | 66 (13.4) |
| Have received any form of abortion education? | |
| Yes | 422 (85.4) |
| No | 72 (14.6) |
| Respondent's current medical school state, by abortion restrictions as of 6 August 2022* | |
| Ban/severe restrictions† | 185 (37.4) |
| No/minimal restrictions‡ | 309 (62.6) |

*Includes all 50 states and the District of Columbia.

†As of 6 August 2022: Alabama, Arizona, Arkansas, Florida, Georgia, Idaho, Indiana, Kentucky, Louisiana, Mississippi, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Tennessee, Texas, Utah, West Virginia, Wisconsin and Wyoming.

‡As of 6 August 2022: Alaska, California, Colorado, Connecticut, Delaware, District of Columbia, Hawaii, Illinois, Kansas, Maine, Maryland, Massachusetts, Minnesota, Nevada, New Hampshire, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Puerto Rico, Rhode Island, Vermont, Virginia and Washington.

no personally identifiable information would be collected. Participants were obtained via snowball convenience sampling. The survey was distributed via emails sent to 125 medical school admission offices and deans (at least one medical school per state), social media through both individual and medical society accounts, and emails to medical school class presidents and individual students to distribute among classmates.

Respondents who (1) did not consent to participate, (2) were not third-year or fourth-year medical students in the USA and/or (3) were not applying to US residency programmes did not meet inclusion criteria and were taken to the survey exit page. Only the first response from each IP address was collected to prevent participants from submitting multiple responses. The survey yielded 604 responses; complete responses were obtained from 494 individuals.

A series of 5-item Likert scales³ (very unlikely (1), unlikely (2), neutral (3), likely (4) and very likely (5)) were used to assess the following: (1) likelihood that residency selection process is influenced by geographic location (eg, lifestyle, hobbies, community engagement), geographic proximity to family/significant other, residency programme prestige and reputation, patient population and state healthcare policies (eg, Affordable Care Act (ACA) expansion); (2) changes in abortion access influencing to which residency programmes to apply, location or state of residency programme, applying to a residency programme affiliated with your medical school, contraceptive planning for you/your partner, when to start a family, where to start a family and starting a family during residency; and (3) whether applying to/ranking a programme in a state with abortion restrictions. Qualitative data were obtained via an optional free text response to 'Is there anything further you would like to add in relation to this topic?' See online supplemental materials for full survey text.

Selected variables

Selected covariates included intended medical specialty, location of medical school, age, gender, race, current marital/partnership status, religion, sexual orientation, abortion education in medical school and to what state(s) respondents are applying. All medical specialties listed by the Electronic Residency Application Service (ERAS) application programme were included.⁴ Location of medical school and residency programmes were dichotomised into states without abortion restrictions and states with abortion restrictions as of 6 August 2022. Age measured in years completed was categorised into five groups: 20–25, 26–30, 31–35, 36–40 and >40. Gender was trichotomised into cis-gender female, cis-gender male and other (ie, gender non-binary, transgender, gender fluid and prefer not to answer). Race/ethnicity was grouped into white, black, Asian, Latinx/Hispanic, mixed race and other (ie, Middle Eastern, Native American, Pacific Islander and Ashkenazi). Marital status was trichotomised into single, married/partnered (ie, married, partnered, in a relationship) and other. Religion was categorised into eight groups: atheist, agnostic, Roman Catholic, other sectors of Christianity, Judaism, Hindu, Muslim and other (ie, Buddhist, Sikh, spiritual, unitarian, other). Statistically significant differences were found only between Roman Catholic respondents and those of the other seven groups; for clarity, results are dichotomised as Catholic versus non-Catholic. Sexual orientation was categorised into four groups: straight/heterosexual, bisexual/pansexual, gay/lesbian/queer and other/prefer not to say. Abortion training was

Table 2 Factors influencing residency application decisions and how changes in abortion access are influencing those decisions

| A. How likely is it that the following factors will influence your residency selection process? n (%) | | | | | |
|---|---------------|------------|------------|------------|-------------|
| | Very unlikely | Unlikely | Neutral | Likely | Very likely |
| Geographic location (lifestyle, hobbies, community engagement) | 4 (0.8) | 2 (0.4) | 15 (3.0) | 149 (30.2) | 324 (65.6) |
| Geographic location (near family or significant other) | 4 (0.8) | 9 (1.8) | 38 (7.7) | 125 (25.3) | 318 (64.4) |
| Residency programme's prestige and reputation | 9 (1.8) | 23 (4.7) | 114 (23.1) | 235 (47.6) | 113 (22.9) |
| Patient population | 8 (1.6) | 17 (3.4) | 74 (15.0) | 234 (47.4) | 161 (32.6) |
| Likelihood of being accepted | 1 (0.2) | 10 (2.0) | 63 (12.8) | 237 (48.0) | 187 (37.0) |
| State's healthcare policies (eg, Affordable Care Act expansion) | 37 (7.5) | 35 (7.1) | 114 (23.1) | 195 (39.5) | 113 (22.9) |
| B. How likely is it that changes in abortion access will influence your decision regarding the following? n (%) | | | | | |
| | Very unlikely | Unlikely | Neutral | Likely | Very likely |
| Which residency programmes you will apply to | 129 (26.1) | 56 (11.3) | 41 (8.3) | 99 (20.0) | 169 (34.2) |
| Location or state of residency programmes to apply to | 72 (14.6) | 22 (4.5) | 20 (4.0) | 115 (23.3) | 265 (53.6) |
| Applying to the residency programme affiliated with your medical school | 152 (30.8) | 66 (13.4) | 133 (26.9) | 56 (11.3) | 87 (17.6) |
| Contraceptive planning for you/your partner | 85 (17.2) | 37 (7.5) | 86 (17.4) | 90 (18.2) | 196 (39.7) |
| When you want to start a family | 102 (20.6) | 70 (14.2) | 140 (28.3) | 67 (13.6) | 115 (23.3) |
| Where you want to start a family | 67 (13.6) | 20 (4.0) | 50 (10.1) | 99 (20.0) | 258 (52.2) |
| Starting a family during residency | 90 (18.2) | 62 (12.6) | 136 (27.5) | 78 (15.8) | 128 (25.9) |
| Apply to a state with abortion restrictions | 153 (31.0) | 133 (26.9) | 57 (11.5) | 70 (14.2) | 81 (16.4) |

dichotomised into received some form of abortion training and received no abortion training.

Statistical analysis

Quantitative

Basic descriptive statistics were provided, including frequency counts and percentages. Univariate analysis using Mann-Whitney U test and Kruskal-Wallis test to assess relationships between the covariates and the aforementioned series of Likert scale questions was performed due to skewness of the data. Bonferroni-adjusted post hoc multiple comparison analyses were also conducted. All analyses were performed using SAS V.9.4, and a type I error rate of 0.05 was used.

Qualitative

Open-ended free responses were analysed thematically to identify patterns.⁵ All authors independently reviewed the data and determined it sufficiently rich for more in-depth analysis. Two authors coded key themes in respondents' written comments. One author reviewed and coded all responses, and another author reviewed these preliminary codes, flagging those with which she disagreed. Authors met to determine intercode reliability. Multiple codes were assigned to responses for which more than one code applied. Code frequencies were evaluated by descriptive statistics in Microsoft Excel.

RESULTS

Of the 494 participants, 54.7% were 26–30 years old, 68.4% identified as cis-gender female, 63.0% identified as white, 64.2% were married/partnered/in a relationship, 27.2% were agnostic, 70.9% identified as straight/heterosexual and 58.5% were applying into a specialty other than Ob-Gyn. Complete demographic data for participants can be found in [table 1](#).

Respondents were assessed, independent of the *Dobbs* decision, on the likelihood that certain factors influenced their residency selection process. The majority of respondents said geographic location in regard to lifestyle and hobbies (95.8%),

being near family or significant others (89.7%), likelihood of being accepted (84.5%), patient population (80.0%) and state healthcare policies (62.4%) would influence their residency selection process. Respondents were then assessed on the likelihood that changes in abortion access would influence their decision. The majority of respondents said changes in abortion access would likely or very likely influence their decision regarding location of considered residency programme (76.9%), where to start a family (72.2%), contraceptive planning for them or their partner (57.9%) and to which specialty to apply (54.2%). A minority of respondents said changes in abortion access would likely or very likely influence their decision regarding when to start a family (36.9%) and starting a family during residency (41.7%) ([table 2](#)).

Qualitative data from participants who responded to the free text question were categorised into key themes.⁶ Of the 74 total comments, 56 demonstrated support for abortion rights and 12 were opposed to abortion rights. Valence was not expressed in the remaining eight comments. The following key themes were identified: impact of *Dobbs* on healthcare beyond abortion (25.7%), politics (24.3%), residency location (21.6%), ethics (21.6%), abortion training (17.6%), residency competitiveness (16.2%), fear for one's own health (12.2%), advocacy and lesbian, gay, bisexual, transgender and queer rights (8.1%) and residency rank list (5.4%) ([table 3](#)).

Residency programmes in restricted states

The majority of respondents (57.9%) indicated they were unlikely or very unlikely to apply to a state with abortion restrictions. Respondents who identified as Roman Catholic (3.5 (1, 4) $p < 0.001$), straight/heterosexual (5 (3, 5) $p < 0.001$), cis-male (4 (1, 5) $p < 0.001$) and/or were applying into specialties other than Ob-Gyn (4 (3, 5) $p < 0.001$) were less likely to be influenced by the *Dobbs* decision in regard to where they were applying to residency. Respondents who identified as Roman Catholic were more likely to apply to a programme in a state with abortion restrictions (4 (2, 5) $p < 0.001$) when compared with all other religions ([table 4A](#)). When asked to list the states to which they were applying,

Table 3 Responses from third-year and fourth-year medical students in regard to residency applications and *Dobbs*

| Theme | Frequency n (%) | Example quotes |
|--|-----------------|---|
| Impact of <i>Dobbs</i> on healthcare broadly (contraception, medical emergencies, impact on other specialties, patient-physician relationship) | 19 (25.7) | 'I'm not sure the government realizes what a significant impact <i>Dobbs</i> can have on equal access to ALL healthcare.' 'Especially with interest in pediatrics, the ramifications of children coming into families unwanted or severely disabled will affect my career and patient population forever. While I have less control over where I go in residency, this absolutely affects where I will practice afterwards. Additionally, there is a lot of other medical legislature about pediatric medical care (eg, trans care laws in Texas and Florida) that will have me steering clear of those states permanently.' |
| Politics | 18 (24.3) | 'Political decisions should never interfere with the practices that a patient and doctor determine are best for the patient. Period. Any other opinions regarding this topic are purely propaganda for a political agenda.' 'I would have likely chosen to apply Ob-Gyn if the field was not going to become a political nightmare.' |
| Residency location | 16 (21.6) | ' <i>Dobbs</i> decision has made some states less desirable to practice in but will still apply to these states for residency due to the fear of going unmatched.' 'Absolutely will not attend residency in a state with anti-abortion laws.' |
| Ethics | 16 (21.6) | 'I wish our school provided us with unbiased, hands-on training from a willing professional educator who sets their own beliefs aside in order to teach medicine we made an oath on to execute one day regardless of our own personal political and religious beliefs.' 'This is an overreach of religion-driven politics by people without the medical and scientific knowledge to be even remotely involved in making these decisions. It will hurt our ability to provide the best care to our patients.' |
| Abortion training | 13 (17.6) | 'I would hate to train as an Ob-Gyn and not have sufficient training to perform abortion. I would also hate to practice and train somewhere where I would be providing bad patient care because of state laws that prevent me from doing the safe and right thing for patients.' 'How residency programs provide training for abortion access and out of abortion emergencies greatly impacts my decision.' 'Abortion is healthcare and needs to be directly addressed as such in medical school. Training in how to discuss options and advocate for patients should be explicitly addressed.' |
| Residency competitiveness | 12 (16.2) | 'I am fearful that residencies that actually teach abortion care are going to become ridiculously competitive. It makes me terrified to apply into the field.' 'Urology is too competitive with too few programs to prioritize abortion rights when applying although I wish I could take it into more consideration.' 'States should understand that enacting these policies will limit their ability to recruit the best and brightest residents. It will also further limit attracting physicians who can take care of pregnant people, with many of these rural states already suffering from a shortage of maternity care providers.' |
| Fear for one's own health | 9 (12.2) | 'I'm personally worried about an ectopic pregnancy or a myriad of other gestational complications that may lead to needing an abortion...there is still a lot of confusion around even what you can offer for clear ectopic pregnancies, and patients are told to return WHEN, not if, they feel sick.' 'I am terrified of what would happen to me right now if I accidentally got pregnant in medical school.' 'I am already a mom, but I've been worried about being pregnant with my second child (miscarried at 5 weeks) in my state with restrictive abortion laws.' 'This decision has affected my consideration not only caring for patients in certain states, but has really made me reconsider residency and family planning for myself. I would be terrified to even get pregnant on purpose in my current state and many others right now and has been a huge push for me to apply out of state as I think about starting a family.' |
| Advocacy and LGBTQ rights | 6 (8.1) | 'I'm a gay man and my decisions about potential overturn of gay marriage from <i>Roe v. Wade</i> being overturned is the reason for many of my answers.' 'My partner is trans which has also affected my decisions regarding residency applications, although hostility to trans and queer people tends to correlate with abortion restrictions so there has been overlap in these considerations.' |
| Residency rank list | 4 (5.4) | 'I am applying to residencies widely but will heavily consider abortion rights in states that programs are in when ranking. I would rank places with protected abortion rights over those without - I am afraid the laws surrounding abortion will affect me if I want to have a family during residency (gestational abnormality requiring abortion, miscarriage care, ectopic pregnancy, etc).' |

LGBTQ, lesbian, gay, bisexual, transgender and queer.

only 31.0% of respondents did not apply to a single state with restrictions. This discrepancy between 57.9% indicating they were unlikely to apply to states with abortion restrictions and only 31.0% not listing a single restricted state might be explained by some of the comments from respondents about competitiveness of programmes:

I am fearful that residencies that actually teach abortion care are going to become ridiculously competitive. It makes me terrified to apply into the field.

While access to abortion is very high on my list of personal priorities... my options are limited by the number of programs... So I am forced to compromise four years to get an education.

Specialty selection

Respondents who identified as Roman Catholic (2 (1, 4) $p < 0.001$) and/or straight/heterosexual (3 (1, 5) $p < 0.001$) were less likely to be influenced by changes in abortion access in their specialty selection (table 4B). There was no statistical difference among cis-gender females and cis-gender males in terms of how changes in abortion access impact their specialty selection. Some individuals identified *Dobbs* as a motivating factor for specialty selection: 'Applying into Ob-Gyn in a post-Roe America is complicated...However, this is also the climate in which patients and American's need passionate Ob-Gyn's more than ever.' Others changed their specialty choice because of *Dobbs*:

I would have likely chosen to apply Ob-Gyn if the field was not going to become a political nightmare.

I would hate to practice and train somewhere where I would be providing bad patient care because of state laws that prevent me from doing the safe and right thing for patients. It detracts from wanting to go into Ob-Gyn.

Contraception planning

Changes in abortion access were least influential in the contraceptive planning of respondents who identified as Roman Catholic (3 (1, 5) $p < 0.001$), cis-gender male (3 (1, 4) $p < 0.001$), gay/lesbian/queer (3 (1, 3) $p < 0.001$) and were non-Ob-Gyn applicants (4 (2, 5) $p = 0.031$) (table 4C). Those who were influenced discussed access to long-acting reversible contraceptives: 'I feel strongly there should be better education regarding treating pain/side effects associated with long-acting reversible contraception like IUDs considering they are likely to increase with this decision'—as well as the possibility that *Dobbs* established a precedent for restrictions on contraception, 'I am concerned that access to birth control will be target next.'

When to start a family

Respondents who identified as cis-gender female (3 (3, 5) $p < 0.001$) were more heavily influenced by changes in abortion access when choosing when to start a family. There was no statistical difference between those applying to Ob-Gyn versus other specialties, between different religions and between different sexual orientations in terms of how likely changes in abortion access impacted their decision regarding when to start a family (online supplemental appendix A, a).

Table 4 Changes in abortion access and its impact on various geographic and family planning factors by demographics

| A. Influence of abortion access on location or state of residency programme to apply to, n (%) | | | | | | | |
|---|-------------------|--------------|-------------|------------|-----------------|--------------|----------|
| | Very unlikely (1) | Unlikely (2) | Neutral (3) | Likely (4) | Very likely (5) | Median (IQR) | P value* |
| Religion | | | | | | | |
| Atheist (n=109) | 6 (5.5) | 4 (3.7) | 5 (4.6) | 22 (20.2) | 72 (66.1) | 5 (4, 5) | <0.0001 |
| Agnostic (n=137) | 11 (8.0) | 4 (2.9) | 6 (4.4) | 41 (29.9) | 75 (54.7) | 5 (4, 5) | |
| Roman Catholic (n=48) | 18 (37.5) | 4 (8.3) | 2 (4.2) | 12 (25.0) | 12 (25.0) | 3.5 (1, 4) | |
| Other sectors of Christianity (n=92) | 22 (23.9) | 3 (3.3) | 3 (3.3) | 19 (20.7) | 45 (48.9) | 4 (2, 5) | |
| Judaism (n=38) | 6 (15.8) | 3 (7.9) | 2 (5.3) | 5 (13.2) | 22 (57.9) | 5 (3, 5) | |
| Hindu (n=16) | 1 (6.3) | 1 (6.3) | 1 (6.3) | 7 (43.8) | 6 (37.5) | 4 (4, 5) | |
| Muslim (n=7) | 1 (14.3) | 0 (0) | 0 (0) | 2 (28.6) | 4 (57.1) | 5 (4, 5) | |
| Other (eg, Buddhist) (n=23) | 1 (4.3) | 1 (4.3) | 0 (0) | 4 (17.4) | 17 (73.9) | 5 (4, 5) | |
| Gender | | | | | | | |
| Cis-gender female (n=338) | 25 (7.4) | 13 (3.8) | 14 (4.1) | 85 (25.1) | 201 (59.5) | 5 (4, 5) | <0.001 |
| Cis-gender male (n=130) | 36 (27.7) | 9 (6.9) | 6 (4.6) | 26 (20.0) | 53 (40.8) | 4 (1, 5) | |
| Sexual orientation | | | | | | | |
| Straight/heterosexual (n=350) | 57 (16.3) | 20 (5.7) | 18 (5.1) | 79 (22.6) | 176 (50.3) | 5 (3, 5) | <0.0001 |
| Bisexual/pansexual (n=79) | 3 (3.8) | 2 (2.5) | 1 (1.3) | 17 (21.5) | 56 (70.9) | 5 (4, 5) | |
| Gay/lesbian/queer (n=34) | 3 (8.8) | 0 (0) | 0 (0) | 10 (29.4) | 21 (61.8) | 5 (4, 5) | |
| Other (n=14) | 1 (7.1) | 0 (0) | 1 (7.1) | 6 (42.9) | 6 (42.9) | 4 (4, 5) | |
| Attending medical school in a state that restricts abortion | | | | | | | |
| Yes (n=185) | 38 (20.5) | 13 (7.0) | 10 (5.4) | 44 (23.8) | 80 (43.2) | 4 (2, 5) | 0.002 |
| No (n=309) | 34 (11.0) | 9 (2.9) | 10 (3.2) | 71 (23.0) | 185 (59.9) | 5 (4, 5) | |
| B. Influence of abortion access on medical specialty to apply to, n (%) | | | | | | | |
| | Very unlikely (1) | Unlikely (2) | Neutral (3) | Likely (4) | Very likely (5) | Median (IQR) | P value* |
| Religion | | | | | | | |
| Atheist (n=109) | 13 (11.9) | 13 (11.9) | 10 (9.2) | 24 (22.0) | 49 (45.0) | 4 (3, 5) | 0.0003 |
| Agnostic (n=137) | 32 (23.4) | 18 (13.1) | 10 (7.3) | 32 (23.4) | 45 (32.8) | 4 (2, 5) | |
| Roman Catholic (n=48) | 20 (41.7) | 5 (10.4) | 7 (14.6) | 6 (12.5) | 10 (20.8) | 2 (1, 4) | |
| Other sectors of Christianity (n=92) | 39 (42.4) | 6 (6.5) | 3 (3.3) | 16 (17.4) | 28 (30.4) | 3 (1, 5) | |
| Judaism (n=38) | 10 (26.3) | 6 (15.8) | 7 (18.4) | 3 (7.9) | 12 (31.6) | 3 (1, 5) | |
| Hindu (n=16) | 2 (12.5) | 2 (12.5) | 2 (2.5) | 7 (43.8) | 3 (18.8) | 4 (2.5, 4) | |
| Muslim (n=7) | 1 (14.3) | 0 (0) | 0 (0) | 2 (28.6) | 4 (57.1) | 5 (4, 5) | |
| Other (eg, Buddhist) (n=23) | 3 (13.0) | 4 (17.4) | 0 (0) | 5 (21.7) | 11 (47.8) | 4 (2, 5) | |
| Gender | | | | | | | |
| Cis-gender female (n=338) | 75 (22.2) | 42 (12.4) | 29 (8.6) | 73 (21.6) | 119 (35.2) | 4 (2, 5) | 0.06 |
| Cis-gender male (n=130) | 42 (32.3) | 14 (10.8) | 11 (8.5) | 24 (18.5) | 39 (30.0) | 3 (1, 5) | |
| Sexual orientation | | | | | | | |
| Straight/heterosexual (n=350) | 100 (28.6) | 46 (13.1) | 33 (9.4) | 68 (19.4) | 103 (29.4) | 3 (1, 5) | <0.0001 |
| Bisexual/pansexual (n=79) | 11 (13.9) | 8 (10.1) | 3 (3.8) | 15 (19.0) | 42 (53.2) | 5 (3, 5) | |
| Gay/lesbian/queer (n=34) | 5 (14.7) | 1 (2.9) | 2 (5.9) | 11 (32.4) | 15 (44.1) | 4 (4, 5) | |
| Other (n=14) | 4 (28.6) | 1 (7.1) | 1 (7.1) | 4 (28.6) | 4 (28.6) | 4 (1, 5) | |
| Attending medical school in a state that restricts abortion | | | | | | | |
| Yes (n=185) | 61 (33.0) | 25 (13.5) | 20 (10.8) | 32 (17.3) | 47 (25.4) | 3 (1, 5) | 0.001 |
| No (n=309) | 68 (22.0) | 31 (10.0) | 21 (6.8) | 67 (21.7) | 122 (39.5) | 4 (2, 5) | |
| C. Influence of abortion access on contraceptive planning, n (%) | | | | | | | |
| | Very unlikely (1) | Unlikely (2) | Neutral (3) | Likely (4) | Very likely (5) | Median (IQR) | P value* |
| Religion | | | | | | | |
| Atheist (n=109) | 12 (11.0) | 7 (6.4) | 16 (17.4) | 23 (21.1) | 51 (46.8) | 4 (3, 5) | 0.0022 |
| Agnostic (n=137) | 14 (10.2) | 12 (8.8) | 25 (18.2) | 26 (19.0) | 60 (43.8) | 4 (3, 5) | |
| Roman Catholic (n=48) | 20 (41.7) | 4 (8.3) | 8 (16.7) | 4 (8.3) | 12 (25.0) | 3 (1, 5) | |
| Other sectors of Christianity (n=92) | 25 (27.2) | 3 (3.3) | 14 (15.2) | 16 (17.4) | 34 (37.0) | 4 (1, 5) | |
| Judaism (n=38) | 6 (15.8) | 5 (13.2) | 4 (10.5) | 9 (23.7) | 14 (36.8) | 4 (2, 5) | |
| Hindu (n=16) | 0 (0) | 1 (6.3) | 4 (25.0) | 5 (31.3) | 6 (37.5) | 4 (3, 5) | |
| Muslim (n=7) | 0 (0) | 0 (0) | 4 (57.1) | 0 (0) | 3 (42.9) | 3 (3, 5) | |
| Other (eg, Buddhist) (n=23) | 2 (8.7) | 3 (13.0) | 7 (30.4) | 2 (8.7) | 9 (39.1) | 3 (3, 5) | |
| Gender | | | | | | | |
| Cis-gender female (n=338) | 28 (8.3) | 22 (6.5) | 60 (17.8) | 67 (19.8) | 161 (47.6) | 4 (3, 5) | <0.0001 |
| Cis-gender male (n=130) | 45 (34.6) | 12 (9.2) | 24 (18.5) | 20 (15.4) | 29 (22.3) | 3 (1, 4) | |

Continued

Table 4 Continued

| A. Influence of abortion access on location or state of residency programme to apply to, n (%) | | | | | | | |
|--|-------------------|--------------|-------------|------------|-----------------|--------------|----------|
| | Very unlikely (1) | Unlikely (2) | Neutral (3) | Likely (4) | Very likely (5) | Median (IQR) | P value* |
| Sexual orientation | | | | | | | 0.0005 |
| Straight/heterosexual (n=350) | 59 (16.9) | 29 (8.3) | 58 (16.6) | 63 (18.0) | 141 (40.3) | 4 (2, 5) | |
| Bisexual/pansexual (n=79) | 7 (8.9) | 5 (6.3) | 12 (15.2) | 18 (22.8) | 37 (46.8) | 4 (3, 5) | |
| Gay/lesbian/queer (n=34) | 12 (35.3) | 2 (5.9) | 13 (38.2) | 1 (2.9) | 6 (17.6) | 3 (1, 3) | |
| Other (n=14) | 2 (14.3) | 0 (0) | 2 (14.3) | 5 (35.7) | 5 (35.7) | 4 (3, 5) | |
| Attending medical school in a state that restricts abortion | | | | | | | 0.2454 |
| Yes (n=185) | 37 (20.0) | 14 (7.6) | 19 (10.3) | 30 (16.2) | 85 (45.9) | 4 (2, 5) | |
| No (n=309) | 48 (15.5) | 23 (7.4) | 67 (21.7) | 60 (19.4) | 111 (35.9) | 4 (3, 5) | |

*Kruskal-Wallis test was used.

Where to start a family

Cis-gender females were more heavily influenced by changes in abortion access and its impact regarding where to start a family (5 (4, 5) $p < 0.001$), while Roman Catholic respondents (3 (1, 5) $p < 0.01$) were least influenced. There was no statistical difference between Ob-Gyn and non-Ob-Gyn applicants or between heterosexual and non-heterosexual respondents, with all group averages being 'very likely' to influence where to start a family (online supplemental appendix A, b). Respondents with gestational capacity expressed concerns for their health in addition to that of their patients:

This decision has affected my consideration not only caring for patients in certain states, but has really made me reconsider residency and family planning for myself. I would be terrified to even get pregnant on purpose in my current state ... and has been a huge push for me to apply out of state as I think about starting a family.

As a person who could become pregnant during residency, I would not apply for residency positions in states where I would have to request time off and travel far distances to access abortion services. I would also never accept a position in a state where I could be prosecuted for traveling to other states to access these services.

Starting a family during residency

Roman Catholic (2 (1, 4) $p = 0.036$) and cis-gender male (3 (1, 4) $p < 0.001$) respondents were least likely to be influenced by the changes in abortion access in regard to starting a family during residency. There was no statistical difference between those applying to Ob-Gyn versus other specialties in terms of how changes in abortion access impacted their decision regarding starting a family during residency, with both group averages being 'neither likely nor unlikely' to influence starting a family during residency (online supplemental appendix A, c). Cis-gender female respondents highlighted exacerbation of existing tensions between prioritising career advancements and personal life during residency:

As a female of reproductive age applying to residency, I am forced to choose between my career and the possibility of ending up in a state where abortion is significantly restricted. While the idea of living in a state where abortion is significantly restricted and my life is therefore at risk is deeply unpleasant, it is unfortunately so prevalent that I cannot avoid excellent residency programs because of this.

Others were fearful of broader impacts of *Dobbs*'s precedent:

I'm a gay man and my decisions about potential overturn of gay marriage from *Roe v. Wade* being overturned is the reason for many of my answers.

My partner is trans which has affected my decisions regarding residency applications, although hostility to trans and queer people tends to correlate with abortion restrictions so there has been overlap in these considerations.

DISCUSSION

Becoming a physician is a privilege and a challenge. Medical students applying to residency are already grappling with a multitude of complex factors, and the revocation of medical and privacy rights in many states in the wake of *Dobbs* simultaneously restricts personal freedoms and introduces a precedent of political interference in healthcare that may impact the careers and health of physicians in every specialty. Medical students entering residency, especially those with gestational capacity, are recognising that their existing lack of freedom may be exacerbated by changes in access to reproductive healthcare.

Respondents in our study highlighted *Dobbs* as a major factor impacting their decision on where to apply for residency, indicating the significant influence abortion access is having on where the next generation of physicians will be training. Respondents who identify as cis-gender female, non-heterosexual and non-Catholic were most driven to apply to states where abortion is protected.

While the majority of respondents indicated a preference to train in states without abortion restrictions, this sample represented individuals from varying demographic and ideological backgrounds. Some respondents explicitly stated their preference to apply only to states with restrictions, highlighting the variety of perspectives—and the powerful influence of political-religious ideology—held by future physicians. The respondents applying only to programmes in states with abortion restrictions predominantly identified as Catholic and cis-gender male. Citizens in the USA are more religiously observant on average than those of other high-income nations,⁷ and the relationship found between religious affiliation and post-*Dobbs* residency decisions points to the strong influence religion has even among medical professionals.

Dobbs has become a factor in the family planning decisions of the majority of medical students surveyed. Overall, cis-gender female respondents are more impacted by *Dobbs* than their male counterparts, although some men with partners of gestational capacity are concerned for the safety of their partners. Respondents who are homosexual, bisexual and transgender are fearful of implications of *Dobbs* for in vitro fertilisation and

gender-affirming care. Physicians have disproportionately high rates of infertility and miscarriage as compared with the general population.^{2 11 12 14} These increased rates of complications are related to the burdens of working in the healthcare system with long hours and physical work and age-related morbidities.

Limitations

One point of confusion in these data is the discrepancy between respondents who said they would not apply to residency programmes in states with abortion restrictions (57.9%) and the number who did not select a single state with restrictions when asked to select each state to which they were applying (31.0%). This could be due to the degree of uncertainty—even among medical trainees—regarding rapid changes in state abortion laws during the course of data collection. On 6 August 2022, when data collection began, abortion was severely restricted or illegal in 22 states. Additionally, the competitiveness of residency applications may require students to apply to multiple states regardless of political opinion.

Additional limitations of these findings include the sampling methodology—snowball convenience sampling—and small sample size compared with population of interest. Cross-sectional data collection, particularly over a time period during which multiple state abortion laws changed, poses limitations for longitudinal generalisability. However, respondents represent 32 states and are demographically similar to medical students across the USA.⁸

CONCLUSIONS

There is little literature examining which factors most influence residency application decisions. Prior research has found that geographic location, family/personal concerns, quality of education and friendliness of residents were the most influential factors.^{15–17} While our respondents did not rank which factors were most important, we did find that geographic location in regard to lifestyle, hobbies and community engagement (95.7%) and geographic location in regard to being near family or significant other (89.6%) were most influential. These similarities suggest that medical students are looking for similar programme attributes, and geographic location and family/personal concerns remain top priorities. Previous studies looking at the impact of *Dobbs* on residency applications found similar results to ours, with most respondents (77.2% and 70.0%) reporting they preferred to apply to states with abortion access to preserve access to care for themselves and their partner, as well as their patients.^{18 19} Results from the 2023 National Residency Matching Program saw a 1.9% reduction in applications to states where abortion is legal, and a 3.0% reduction to states where abortion is banned.^{20 21} However, for those applying into Ob-Gyn, there was a 5.3% reduction in applications to states where abortion is legal and a 10.5% reduction in applications to states where abortion is banned.^{20 21}

Medical students care about the quality of education they receive during residency, and some respondents expressed concerns, which are reflected in recent literature,^{22–25} that abortion bans may compromise their ability to fulfil Accreditation Council for Graduate Medical Education (ACGME) requirements and meet clinical practice guidelines. The majority (85%) of respondents received some kind of abortion education during medical school, and many abortion care providers make their career decisions prior to starting residency.²⁶ Medical students are taught to uphold the four principles of medical ethics—autonomy, beneficence, non-maleficence and justice—and

education about abortion, as a component of reproductive healthcare within the context of medical ethics, allows students to understand how limiting abortion access contradicts these core principles.²⁷

When medical students become residents, they assume the responsibility to fulfil the ethical duties of medical practice. As a result of *Dobbs*, physicians across the USA are now being prevented from upholding these duties—physicians must advocate for their patients when policies directly cause harm by contradicting best practices as determined by evidence-based guidelines.²⁸ Medical students on the brink of becoming physicians will begin residency while not just the value of the rights of their patients with gestational capacity, but their own humanity, is being called into question. There is no question that medical practice in the USA is inextricably tied to interests—political, religious, legal—other than those of patients.²⁹ The next generation of physicians must grapple with this insult to the core of what it means to be a doctor, and this is reflected in their choices of where to complete residency.

Twitter Kellen Mermin-Bunnell @nellmmb

Contributors KMB and AMT: survey conceptualisation, survey distribution, data collection, manuscript writing, reviewed and edited the manuscript, guarantor. KW: statistical analysis, reviewed and edited the manuscript. BA: survey distribution, reviewed and edited the manuscript. LPK: reviewed and edited the manuscript. JK: survey conceptualisation, reviewed and edited the manuscript.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants but Emory University Institutional Review Board (STUDY00004871) exempted this study. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

All data relevant to the study are included in the article or uploaded as supplementary information.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

ORCID iD

Kellen Mermin-Bunnell <http://orcid.org/0000-0002-4612-8152>

REFERENCES

- Guttmacher Institute. Interactive Map: US Abortion Policies and Access After Roe, Available: <https://states.guttmacher.org/policies/> [Accessed 24 Aug 2022].
- Cai C, Vandermeer B, Khurana R, *et al.* The impact of occupational shift work and working hours during pregnancy on health outcomes: a systematic review and meta-analysis. *Am J Obstet Gynecol* 2019;221:563–76.
- Jebb AT, Ng V, Tay L. A review of key Likert scale development advances: 1995–2019. *Front Psychol* 2021;12:637547.
- AAMC. ERAS 2023 Participating Specialties & Programs, Available: <https://systems.aamc.org/eras/erasstats/par/index.cfm> [Accessed 16 Nov 2022].
- Homaifar N, Freedman L, French V. "she's on her own": a thematic analysis of clinicians' comments on abortion referral". *Contraception* 2017;95:470–6.
- Kiger ME, Varpio L. Thematic analysis of qualitative data: AMEE guide No.131. *Med Teach* 2020;42:846–54.
- Fahmy D. Americans are far more religious than adults in other wealthy nations. Pew Research Center. Available: <https://www.pewresearch.org/fact-tank/2018/07/31/americans-are-far-more-religious-than-adults-in-other-wealthy-nations/> [Accessed 27 Nov 2022].
- AAMC. FACTS: applicants and Matriculants data | AAMC. 2022. Available: <https://www.aamc.org/data-reports/students-residents/interactive-data/2022-facts-applicants-and-matriculants-data> [Accessed 28 Nov 2022].

- 9 Simoni MK, Mu L, Collins SC. Women's career priority is associated with attitudes towards family planning and ethical acceptance of reproductive technologies. *Human Reproduction* 2017;32:2069–75.
- 10 Kin C, Yang R, Desai P, et al. Female trainees believe that having children will negatively impact their careers: results of a quantitative survey of trainees at an academic medical center. *BMC Med Educ* 2018;18:260.
- 11 Rangel EL, Smink DS, Castillo-Angeles M, et al. Pregnancy and motherhood during surgical training. *JAMA Surg* 2018;153:644–52.
- 12 Lean SC, Derricott H, Jones RL, et al. Advanced maternal age and adverse pregnancy outcomes: a systematic review and meta-analysis. *PLoS One* 2017;12:e0186287.
- 13 Pinheiro RL, Areia AL, Mota Pinto A, et al. Advanced maternal age: adverse outcomes of pregnancy, A meta-analysis. *Acta Med Port* 2019;32:219–26.
- 14 Rangel EL, Castillo-Angeles M, Easter SR, et al. Incidence of infertility and pregnancy complications in US female Surgeons. *JAMA Surg* 2021;156:905.
- 15 Lewis P, Hayward J, Chertoff J. Student interviews for radiology residency: what influences how students rank programs *J Am Coll Radiol* 2010;7:439–45.
- 16 Pretorius ES, Hrung J. Factors that affect national resident matching program rankings of medical students applying for radiology residency. *Acad Radiol* 2002;9:75–81.
- 17 Wright KM, Ryan ER, Gatta JL, et al. Finding the perfect match: factors that influence family medicine residency selection. *Fam Med* 2016;48:279–85.
- 18 Bernstein SA, Levy MS, McNeilly S, et al. Practice location preferences in response to state abortion restrictions among physicians and trainees on social media. *J Gen Intern Med* 2023;38:2419–23.
- 19 Hulsman ML, Bradley DPK, Caldwell DA, et al. Impact of dobbs decision on retention of indiana medical students for residency. *Am J Obstet Gynecol MFM* 2023.
- 20 Orgera K, Mahmood H, Research A, et al. Training location preferences of U.S. medical school graduates post Dobbs v. Jackson women'S health. 2023. Available: <https://www.aamcresearchinstitute.org/our-work/data-snapshot/training-location-preferences-us-medical-school-graduates-post-dobbs-v-jackson-women-s-health> [Accessed 07 Oct 2023].
- 21 NRMP. National resident matching program, results and data: 2021 main Residency match. Washington, DC National Resident Matching Program; 2023. Available: https://www.nrmp.org/wp-content/uploads/2023/04/Advance-Data-Tables-2023_FINAL-2.pdf
- 22 Christian NT, Borges VF. What Dobbs means for patients with breast cancer. *N Engl J Med* 2022;387:765–7.
- 23 Silverstein J, Van Loon K. The implications of the supreme court decision to overturn roe V wade for women with pregnancy-associated cancers. *JAMA Oncol* 2022;8:1394–5.
- 24 MacDonald A, Gershengorn HB, Ashana DC. The challenge of emergency abortion care following the dobbs ruling. *JAMA* 2022;328:1691–2.
- 25 Rubin R. Threats to evidence-based care with teratogenic medications in States with abortion restrictions. *JAMA* 2022;328:1671.
- 26 Henderson R, Barreto V, Nyren M, et al. Understanding pre-residency abortion training pathways and career choices in the United States: a qualitative study. *BMJ Sex Reprod Health* 2023;bmjsrh-2023-201872.
- 27 Burns RM, Shaw KA. Standardizing abortion education: what medical schools can learn from residency programs. *Curr Opin Obstet Gynecol* 2020;32:387–92.
- 28 Wynia MK. Professional civil disobedience — medical-society responsibilities after dobbs *N Engl J Med* 2022;387:959–61.
- 29 Berwick DM. Politics and health care. *JAMA* 2018;320:1437–8.