



Parental leave policies in graduate medical education: A systematic review



Laura S. Humphries, Sarah Lyon, Rebecca Garza, Daniel R. Butz, Benjamin Lemelman, Julie E. Park*

Section of Plastic and Reconstructive Surgery, Department of Surgery, University of Chicago, Chicago, IL, United States

ARTICLE INFO

Article history:

Received 10 February 2017

Received in revised form

1 June 2017

Accepted 20 June 2017

Keywords:

GME

Leave of absence

Maternity leave

Paternity leave

Parental leave

ABSTRACT

BACKGROUND: A thorough understanding of attitudes toward and program policies for parenthood in graduate medical education (GME) is essential for establishing fair and achievable parental leave policies and fostering a culture of support for trainees during GME.

METHODS: A systematic review of the literature was completed. Non-cohort studies, studies completed or published outside of the United States, and studies not published in English were excluded. Studies that addressed the existence of parental leave policies in GME were identified and were the focus of this study.

RESULTS: Twenty-eight studies addressed the topic of the existence of formal parental leave policies in GME, which was found to vary across time and ranged between 22 and 90%. Support for such policies persisted across time.

CONCLUSIONS: Attention to formal leave policies in GME has traditionally been lacking, but may be increasing. Negative attitudes towards parenthood in GME persist. Active awareness of the challenges faced by parent-trainees combined with formal parental leave policy implementation is important in supporting parenthood in GME.

© 2017 Published by Elsevier Inc.

1. Introduction

Parenthood during graduate medical education (GME) has been a topic of interest since the late 1970s. With increasing percentages of women in medicine, this subject has resurfaced recently as part of a broader conversation within government and industry about gender in the American workplace.¹ Women physicians face particular challenges because their training programs, which can span nearly a decade, coincide with traditional childbearing years.

Although these challenges are well known, formal and informal support for parenthood in GME remains variable and poorly defined. The Accreditation Council for Graduate Medical Education (ACGME) does not have a single, defined parental leave policy that all GME programs must follow.² While the ACGME mandates that GME programs must have leave policies in place, the ACGME does not provide specific recommendations or guidelines for their

development. Instead, individual GME programs are left to create their own leave policies that are consistent with applicable laws (Table 1) and that satisfy the relevant certifying board requirements.²

The goal of this study is to provide a systematic review of parental leave policies in graduate medical education. Specifically, we aim to identify the number of studies available in the literature addressing the existence of parental leave policies in GME.

2. Methods

An electronic search of the PubMed, Medline, Scopus, and PsycInfo databases was completed using multiple search terms (Fig. 1), including *internship*, *residency*, *leave* and *pregnancy* (Table 2). Search criteria incorporated relevant articles from January 1, 1960 to December 13, 2015. Studies that pertained to family planning or leave (including pregnancy/childbearing, paternity/maternity/parental leave, breastfeeding and childcare issues) during GME in the United States (including studies addressing these issues in residency, fellowship, or across multiple training time periods) were included in the initial pool of studies reviewed. Non-cohort studies

* Corresponding author. The University of Chicago Medicine and Biological Sciences, 5841 S. Maryland Avenue, MC 6035, Chicago, IL 60637, United States.

E-mail address: jpark@surgery.bsd.uchicago.edu (J.E. Park).

Table 1

Parental leave policies: United States government laws and Graduate Medical Education regulations.

United States Government Laws	
Civil Rights Act of 1964, Title VII ³	Prohibits employment discrimination based on race, color, religion, sex and national origin.
Pregnancy Discrimination Act (PDA) (1978) ⁴	Amendment to Title VII of Civil Rights Act of 1964. Prohibits discrimination in employment against women affected by pregnancy or related conditions.
Americans with Disabilities Act (ADA) (1990) ⁵	Prohibits discrimination against people with disabilities in employment, public services, public accommodations and in telecommunications. Employers must treat women who are temporarily unable to perform their jobs due to medical condition related to pregnancy or childbirth similar to any other temporarily disabled employee
Family and Medical Leave Act (FMLA) (1993) ⁶	Entitles eligible employees of covered employers to take unpaid, job-protected leave for specified family and medical reasons. 12 workweeks leave in a 12-month period.
Patient Protection and Affordable Care Act (PPACA) (2010) ⁷	Amendment to Section 7 of the Fair Labor Standards Act (FLSA) Employers required to provide “reasonable break time for an employee to express breast milk for her nursing child for 1 year after the child’s birth each time such employee has need to express the milk.” Employers required to provide “a place, other than a bathroom, that is shielded from view and free from intrusion from coworkers and the public, which may be used by an employee to express breast milk”
Graduate Medical Education Regulations	
Accreditation Council for Graduate Medical Education (ACGME) ²	IV.A.3. An applicant invited to interview for a resident/fellow position must be informed in writing or by electronic means of the terms, conditions and benefits of appointment to the ACGME-accredited program, either in effect at the time of the interview or that will be in effect at the time of his or her eventual appointment A) Information that is provided must include: financial support; vacations; parental, sick, and other leaves of absence; and professional liability, hospitalization, health, disability, and other insurance accessible to residents/fellows and their eligible dependents. IV.B.2. The contract/agreement of appointment must directly contain or provide a reference to the following items: h) disability insurance for residents/fellows; i) vacation, parental, sick, and other leave(s) for residents/fellows, compliant with applicable laws j) timely notice of the effect of leaves on the ability of residents/fellows to satisfy requirements for program completion IV.G Vacation and Leaves of Absence IV.G.I. The sponsoring institution must have a policy for vacation and other leaves of absence, consistent with applicable laws. IV. G.2. This policy must ensure that each of its ACGME-accredited programs provides its residents/fellows with accurate information regarding the impact of extended leave of absence upon the criteria for satisfactory completion of the program and upon a resident’s/fellows’ eligibility to participate in examinations by the relevant certifying board(s).

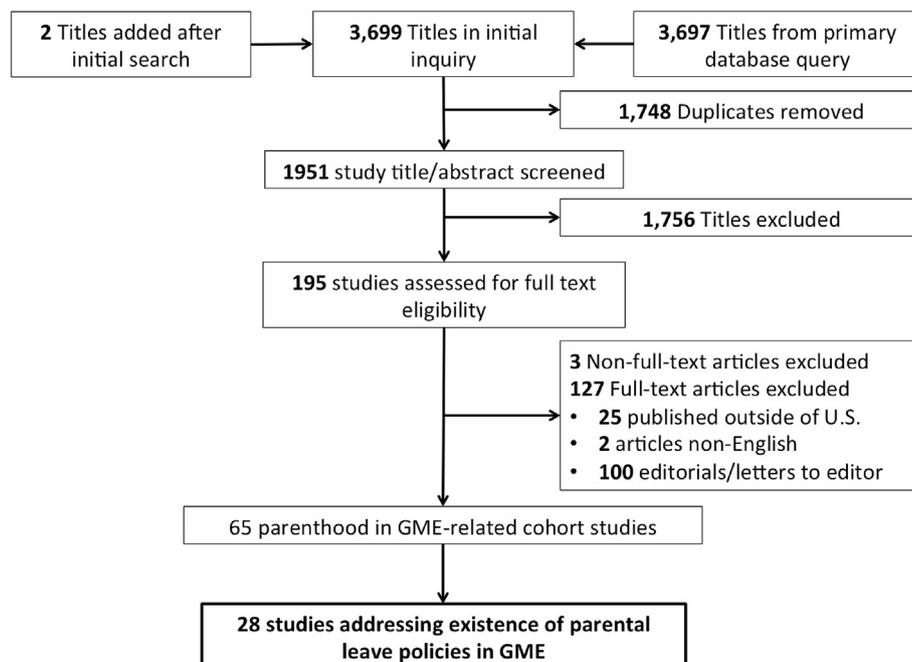
**Fig. 1.** Article selection process.

Table 2
Systematic review search terms used for article search.

Search engine	Number of articles	Search terms
PubMed	1483	((residency, leave) OR ((residency, pregnancy)))
Medline	808	residency, leave OR residency, pregnancy
Scopus	1539	((internship OR residency) AND leave) OR ((internship OR residency) AND pregnancy))
PsychInfo	135	(residency and leave) OR (residency and pregnancy)

(e.g. editorials, letters to the editor), studies completed or published outside of the United States and studies not published in English were excluded. Studies that addressed the existence of parental leave policies in GME were identified and were the focus of this study. Two of the investigators independently completed study selection, and a third investigator resolved discrepancies. Data extraction was completed by one individual (LSH).

This study adhered to standardized methodological principles of PRISMA for reporting systematic reviews.⁸ Due to the heterogeneity of the data reporting amongst articles, a qualitative analysis was performed for each results category. Themes included existence of formal leave policies, amount of leave time allowed, impact of parental leave on training and support for parenthood in residency.

3. Results

3.1. Systematic review results

In the first inquiry of the systematic review, 3,699 papers were identified. After duplicates were removed, 165 articles^{9–73} met initial inclusion criteria. Editorials that otherwise met initial inclusion criteria ($n = 100$) were removed to compile the final list of 65 articles. All were cross-sectional studies: 62 survey, 1 database⁵⁸ and 2 interview studies.^{21,57} Publications on parenthood in GME were clustered in two time periods — the late 1980s–early 1990s and the 2000s (Fig. 2). Of these, 28 articles specifically addressed the existence of parental leave policies (Fig. 2).

3.2. Subjects

Twenty-one studies focused on parental leave policies during residency and/or fellowship, and 7 articles focused on this topic across multiple professional periods. Surveyed individuals varied, including female residents, male residents, partners of male residents, fellows, program directors, department chairs, female faculty, and male faculty. No studies included partners of female residents. Various medical and surgical specialties were represented.

3.3. Existence of parental leave policies

Twenty-eight studies addressed the topic of the existence of formal parental leave policies in graduate medical education.^{12,14–16,18,21,22,24,27–29,33,34,42–45,49,52–54,58–63,66} Six of the included 28 studies were from surgical specialties including general surgery,^{18,44,59} otolaryngology,²¹ urology⁴² and thoracic surgery.⁴⁹

The existence of formal family leave policies varied across time. Of the studies published between 1986 and 1992, two studies reported existence of maternity leave policies with 22–66% of surveyed programs having formal policies.^{52,60} None in this time period mentioned paternity leave. Of the studies published between 1995 and 2016, nine described maternity or family leave policies.^{12,21,22,43–45,54,59} In a 1991 survey of program directors of Boston-area hospitals, 82% (9/11) of responding hospitals indicated

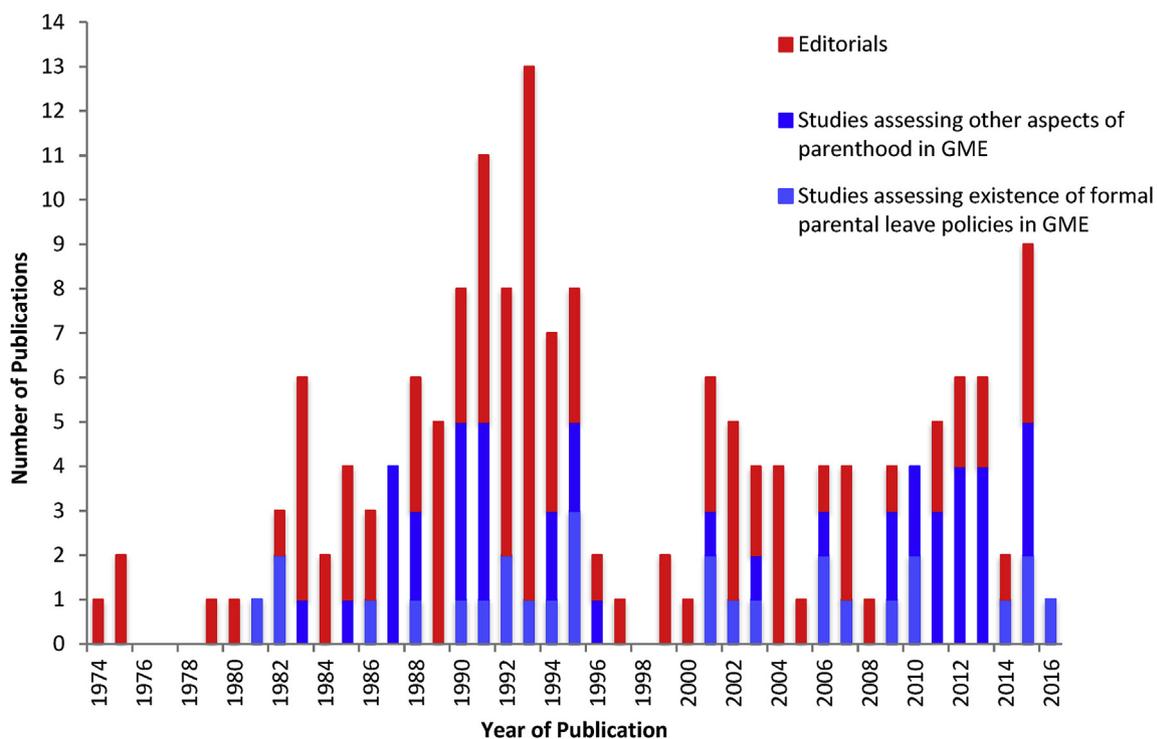


Fig. 2. Published editorials and studies on parenthood in graduate medical education (GME) across time. (Color version of figure available online.)

they had a specific written maternity leave policy, and 75% of programs reported implementation of the policy.⁵² Six studies described having formal paternity leave policies, all after the year 1995.^{12,22,28,34,43,45,59}

The existence of formal family leave policies varied across specialty. Surveys of pediatric and radiology residency program directors indicated high rates of formal maternity leave policies: 90% and 88%, respectively.^{43,45} Within surgery, individual institutions have demonstrated success with following a set of general guidelines for management of maternity in residency.^{18,21} Female urologists reported a 42% formal maternity leave policy at their institutions,⁴² and a recent general surgery study indicated that 67% of programs have a formal maternity leave policy.⁵⁹

As to paternity leave, obstetrics-gynecology (OB-GYN) programs had the highest proportion of such policies at 69%.²² Forty-eight percent of surveyed general surgery programs had formal paternity leave policies in 2016, with larger programs more likely to have these policies (72% of programs with >6 residents vs. 40% of programs with <6 residents).⁵⁹

3.4. Parental leave time and impact on length of training

In the absence of formal parental leave time allotment, leave time for family purposes was taken from vacation time,^{16,18,29,33,43,53,60} sick leave^{29,43,52,53} or disability.^{16,52} Two studies reported that female residents took unpaid leave.^{33,53} In a survey of female residents and partners of male residents, 50% of female residents were covered by formal maternity leave policies compared to 70% of working partners of male residents.³³ One study investigated the impact of parental leave on extending residency training and the timing of entrance into the specialty board certification.⁵⁸ There were maximum limits of absence from training for 21 of 26 specialties. The impact of a six-week parental leave in training could result in no delay in board entry or could result in delay of up to one year, depending on the rules of different specialty boards. In this study, most boards did not have specific policies related to parental leave.

3.5. Parental leave support

High support for the development of standardized policies for parental leave across specialties was observed, even in the earlier studies from the 1990s.^{12,14,27} Eighty-seven percent of surveyed residents at a single institution favored maternity/paternity leave in 1994.²⁷ Seventy-five percent of radiology program directors supported the development of standardized residency program guidelines for pregnant residents.¹⁴ Over 50% of pediatric female residents with children felt that existence of maternity leave, length of leave and time needed to make up absence were important in selecting a residency program, while more than 33% of male residents felt paternity leave policies were important in choosing a residency program.¹² A survey study within one general surgery program demonstrated that resident maternity could be managed safely and fairly to the satisfaction of both residents and faculty.¹⁸

A few studies, however, found lack of support for parental issues. One study within thoracic surgery indicated that while 76% (67/88) of surveyed women expressed need for a reproductive health wellness policy to allow extended time for reproductive planning, pregnancy and family care issues, only 32% (8/25) of men expressed this need.⁴⁹

4. Discussion

The topic of parenthood in medicine broadly, and in GME specifically, has been discussed since the late 1970s. Both published and

informal conversations among governing bodies within medical and surgical specialties have reemerged in recent years, including among the American College of Surgeons in the last year.⁷⁴ This conversation is timely, as there has been a noticeable shift within industry (e.g. Google, Facebook,⁷⁵ Amazon⁷⁶ and Netflix⁷⁷) and the U.S. military⁷⁸ toward more family-friendly employment policies.

Our review shows a number of issues surrounding the topic of parenthood in GME, specifically in regard to the existence of formal parental leave policies. The complex nature of these topics and wide variation between studies preclude performance of quantitative meta-analysis, thus making way for qualitative discussion.

The ACGME does not have a formal parental leave policy that GME programs must follow. Instead, the ACGME mandates that GME programs must create leave policies that are consistent with applicable laws (Table 1) and that satisfy the relevant certifying board requirements.² As such, there is great variability across specialties and individual GME programs as to how parental leave is approached and handled. This inconsistency is reflected in the results of this study.

The existence of formal parental leave policies varied across institutions and specialties and has seemed to increase over time. Maternity leave was the main focus of early studies. The existence and study of paternity leave and parental leave policies appeared in more recent years, mostly after 1995. In addition, issues of parenthood outside of traditional male-female relationships (e.g. same-sex partnerships, non-married unions), including adoption, were considered in more recent publications but were still scarce. In the absence of formal parental leave policies, leave time designated for other reasons was often used for situations of family leave (e.g. sick leave, disability, vacation). Female residents were less likely to be covered by formal maternity leave policies than partners of male residents.

The lack of uniformity in parental leave policy and guidelines perpetuates the lack of parity for having children during GME across programs. The attitudes of GME programs toward parenthood may range from hostile, to indifferent, to supportive. Combining a family and medical career is stressful,^{37,60,61,65} more so for females than males.^{49,61,71,72} Pregnancy and childbirth altered trainee choice of GME program, date of completion, career plans and/or pursuit of additional degrees more often for women than for men.¹³ The perception of negative impact on one's career may result in delay in childbearing for many female residents across specialties.³⁴ The performance of a pregnant or parent female resident is likely to be perceived negatively both by the resident herself^{34,35} and her colleagues,^{16,26} as well as by the program director or department chair.^{26,60}

Perhaps one of the most impactful findings of negative perception of parenthood in residency was from a 2016 survey of general surgery program directors.⁵⁹ Sixty-one percent of program directors reported that becoming a parent negatively affected female trainees' work, including increased burden on fellow residents (33%), fewer scholarly activities (9%), fewer clinical activities (8%), less dedication to patient care (6%) and decreased timeliness (5%).⁵⁹ In addition, general surgery program directors were less likely to report that becoming a parent negatively affects a male resident's than a female resident's work (34% vs. 61%) and reported that children decrease female resident well-being more often than that of male residents (32% vs. 9%). Fifteen percent of general surgery program directors said they would advise against having children during residency.

This perception of negative impact of parenthood on clinical performance and academic productivity, especially for women, persists despite data that indicate the opposite. For example, the number of clinical cases completed by pregnant OB-GYN residents has not been shown to be significantly different than peers, and

academic productivity does not seem to differ based on a parent trainee's gender.^{21,40} In a retrospective review of general surgery residents, factors such as age, sex and incidence of childbearing during training were not associated with increased risk of attrition.⁷⁹ In addition, general surgery residents with children during training did not have significantly different total case numbers, in-service scores or written/oral board pass rates than those without children.⁷⁹ In a different study, perceived impact of childbearing on general surgery resident training had no effect on a resident's decision to have a child during residency for most trainees who had children in residency.⁶⁷ The majority of female surgeons without children reported that family had no effect on their career, whereas women with children reported that their family affected their career a moderate amount. Only 15% of 128 female surgeons with children felt that having children markedly slowed their career.³²

Furthermore, there remains high career and personal satisfaction among residents and physicians who have children. Career satisfaction was not significantly different between female physicians with and without children. Ninety-one percent of women surveyed were "satisfied" or "very satisfied" with their careers.⁶⁶ High overall rates of career satisfaction were also reported among female orthopedic and thoracic surgeons.^{32,49} Thus, in the midst of prevalent negative attitudes toward trainee parents and females in particular, a culture change toward an environment of support for trainee parents is imperative to identify means to aid in their success.

In the face of diverse approaches to parenthood in GME, training programs have managed to graduate competent physicians and surgeons, indicating that combining parenthood and residency training is possible. The environment of support for parenthood in GME would best be reinforced by formal parental leave policies. Currently, parental leave policies created by specific GME programs are often limited by the requirements of their governing specialty boards.⁵⁸ Most specialty boards have a "time spent" requirement that must be fulfilled in order for graduating residents to be eligible for their board examinations. For example, the American Board of Surgery (ABS) requires 48 weeks per year of full-time clinical activity over a 5-year residency, allowing an additional 4 weeks of non-clinical time for "documented medical conditions." Other arrangements beyond the standard medical leave must be approved by the ABS. In contrast, the American Board of Plastic Surgery (ABPS) recently allowed the 48-week/year of clinical training to be averaged across the 6-year training period to accommodate for extended leaves of absence; the remaining 4 weeks in the year could be dedicated to vacation, meeting attendance, medical leave or other reasons as determined by the institution or program.⁸⁰ In addition, in the final 2 years of training, plastic surgery residents may have 1 week leave for medical reasons. In contrast, vacation time allotment is determined by the GME in many institutions as the residents are considered hospital employees; thus, in these cases, program directors have less leeway in allocating additional parental leave time.

The amount of "time spent" engaged in clinical activity in training may eventually give way to quality of "time spent" with the introduction of competency-based milestones.^{81,82} This transition in the way trainees are evaluated could impact the actual length of time required to complete residency, and thus, provide more flexibility for parental leave. Making the process of having children during training fair for all trainees will require a shift in attitude toward greater support, and this culture change must be reinforced with adoption of formal parental leave policies.

5. Conclusion

Although more parental leave policies in training programs have

emerged over time, negative attitudes towards childbearing and childrearing in training continue to impact residents and fellows. Issues around paternity leave and adoption have entered the conversation only in recent years. Despite persistent challenges, parenthood in GME seems to have a neutral or positive overall impact on trainee performance and productivity. A culture shift toward support and increased awareness of the challenges faced by parent-trainees, coupled with formal parental leave policies from medical governing bodies, is needed.

Clinical trial registration

Not applicable.

Funding source

No external funding was secured for this study.

Commercial associations/financial disclosures

None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this manuscript.

References

- Bass BL, Napolitano LM. Gender and diversity considerations in surgical training. *Surg Clin N. Am.* 2004;84(6):1537–1555. <http://dx.doi.org/10.1016/j.suc.2004.06.008>.
- Education ACFGM. *ACGME Institutional Requirements*. Institutional Organization; 2010. http://www.acgme.org/Portals/0/PDFs/ab_ACGMEPoliciesProcedures.pdf.
- Civil Rights Act of 1964*. Public Law 88-352, 78 Stat. 241. 1964.
- The Pregnancy Discrimination Act of 1978*. Public Law 95-555, 92 Stat. 2076. 1978.
- Americans with Disabilities Act of 1990*. Public Law 101-336, 104 Stat. 327. 1990.
- Family and Medical Leave Act of 1993*. Public Law 103-3, 107 Stat. 6. 1993.
- Patient Protection and Affordable Care Act*. Public Law 111-148, 124 Stat. 119. 2010.
- Moher D, Liberati A, Tetzlaff J, Altman DG, Gouppara TP. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *J Clin Epidemiol.* 2009;62(10):1006–1012. <http://dx.doi.org/10.1016/j.jclinepi.2009.06.005>.
- Abbett SK, Hevelone ND, Breen EM, et al. Interest in and perceived barriers to flexible-track residencies in general surgery: a national survey of residents and program directors. *JSURG.* 2011;68(5):365–371. <http://dx.doi.org/10.1016/j.jsurg.2011.04.007>.
- Balk SJ, Christoffel KK, Bijur PE. Pediatricians' attitudes concerning motherhood during residency. *Am J Dis Child.* 1990;144(7):770–777.
- Bergman AS, Adler R. Support services for pediatric trainees. A survey of training program directors. *Am J Dis Child.* 1991;145(9):1002–1005.
- Berkowitz CD, Frintner MP, Cull WL. Pediatric resident perceptions of family-friendly benefits. *Acad Pediatr.* 2010;10(5):360–366. <http://dx.doi.org/10.1016/j.acap.2010.06.013>.
- Blair JE, Mayer AP, Caubet SL, Norby SM, O'Connor MI, Hayes SN. Pregnancy and parental leave during graduate medical education. *Acad Med.* November 2015;1. <http://dx.doi.org/10.1097/ACM.0000000000001006>.
- Blake ME, Oates ME, Applegate K, Kuligowska E. Proposed program guidelines for pregnant radiology residents. *Acad Radiol.* 2006;13(3):391–401. <http://dx.doi.org/10.1016/j.acra.2005.10.007>.
- Bongiovi ME, Freedman J. Maternity leave experiences of resident physicians. *J Am Med Womens Assoc.* 1993;48(6), 185–188–193.
- Braun DL, Susman VL. Pregnancy during psychiatry residency : a study of attitudes. *Acad Psychiatry.* 1992;16(4):178–185. <http://dx.doi.org/10.1007/BF03341390>.
- Brogdon BG, Herbert DE. Pregnancy in radiology residents. *Investig Radiol.* 1991;26(1):102–103.
- Carty SE, Colson YL, Garvey LS, et al. Maternity policy and practice during surgery residency: how we do it. *Surgery.* 2002;132(4):682–688. <http://dx.doi.org/10.1067/msy.2002.127685>.
- Chen MM, Yeo HL, Roman SA, Bell Jr RH, Sosa JA. Life events during surgical residency have different effects on women and men over time. *Surgery.* 2013;154(2):162–170. <http://dx.doi.org/10.1016/j.surg.2013.03.014>.
- Cochran A, Belder WE, Crandall M, Brasel K, Hauschild T, Neumayer L. Barriers to advancement in academic surgery: views of senior residents and early career faculty. *AJS.* 2013;206(5):661–666. <http://dx.doi.org/10.1016/j.amjsurg.2013.07.003>.
- Cole S, Arnold M, Sanderson A, Cupp C. Pregnancy during otolaryngology residency: experience and recommendations. *Am Surg.* 2009;75(5):411–415.
- Davis JL, Baillie S, Hodgson CS, Vontver L, Platt LD. Maternity leave: existing policies in obstetrics and gynecology residency programs. *Obstet Gynecol.*

- 2001;98(6):1093–1098.
23. Dixit A, Feldman-Winter L, Szucs KA. Frustrated, “depressed,” and “devastated” pediatric trainees: US academic medical centers fail to provide adequate workplace breastfeeding support. *J Hum Lactation*. 2015;31(2):240–248. <http://dx.doi.org/10.1177/0890334414568119>.
 24. Dixit A, Feldman-Winter L, Szucs KA. Parental leave policies and pediatric trainees in the United States. *J Hum Lactation*. 2015;31(3):434–439. <http://dx.doi.org/10.1177/0890334415585309>.
 25. Eskenazi L, Weston J. The pregnant plastic surgical resident: results of a survey of women plastic surgeons and plastic surgery residency directors. *Plast Reconstr Surg*. 1995;95(2):330–335.
 26. Franco K, Evans CL, Best AP, Zrull JP, Pizza GA. Conflicts associated with physicians' pregnancies. *Am J Psychiatry*. 1983;140(7):902–904. <http://dx.doi.org/10.1176/ajp.140.7.902>.
 27. Franco K, Tamburrino M, Campbell N, Evans C, Jurs S. Conflict with physician pregnancy revisited. *Acad Psychiatry*. 1994;18(3):146–153. <http://dx.doi.org/10.1007/BF03341869>.
 28. Gabbe SG, Morgan MA, Power ML, Schulkin J, Williams SB. Duty hours and pregnancy outcome among residents in obstetrics and gynecology. *Obstet Gynecol*. 2003;102(5 Pt 1):948–951.
 29. Gjerdingen DK, Chaloner KM, Vanderscoff JA. Family practice residents' maternity leave experiences and benefits. *Fam Med*. 1995;27(8):512–518.
 30. Grunebaum A, Minkoff H, Blake D. Pregnancy among obstetricians: a comparison of births before, during, and after residency. *Am J Obstet Gynecol*. 1987;157(1):79–83.
 31. Halperin TJ, Werler MM, Mulliken JB. Gender differences in the professional and private lives of plastic surgeons. *Ann Plast Surg*. 2010;64(6):775–779. <http://dx.doi.org/10.1097/SAP.0b013e3181b02292>.
 32. Hamilton AR, Tyson MD, Braga JA, Lerner LB. Childbearing and pregnancy characteristics of female orthopaedic surgeons. *J Bone Jt Surg Am*. 2012;94(11):1–9. <http://dx.doi.org/10.2106/JBJS.K.00707>.
 33. Harris DL, Osborn LM, Schuman KL, Reading JC, Prather MB, Politzer RM. Implications of pregnancy for residents and their training programs. *J Am Med Womens Assoc*. 1990;45(4):127–8–131.
 34. Holliday EB, Ahmed AA, Jagsi R, et al. Pregnancy and parenthood in radiation oncology, views and experiences survey (PROVES): results of a blinded prospective trainee parenting and career development assessment. *Radiat Oncol Biol*. 2015;92(3):516–524. <http://dx.doi.org/10.1016/j.ijrobp.2015.02.024>.
 35. Hutchinson AM, Anderson NS, Gochnour GL, Stewart C. Pregnancy and child-birth during family medicine residency training. *Fam Med*. 2011;43(3):160–165.
 36. Kacmar JE, Taylor JS, Nothnagle M, Stumpff J. Breastfeeding practices of resident physicians in Rhode Island. *Med Health R I*. 2006;89(7):230–231.
 37. Klebanoff MA, Shiono PH, Rhoads GG. Outcomes of pregnancy in a national sample of resident physicians. *N Engl J Med*. 1990;323(15):1040–1045. <http://dx.doi.org/10.1056/NEJM199010113231506>.
 38. Klebanoff MA, Shiono PH, Rhoads GG. Spontaneous and induced abortion among resident physicians. *JAMA*. 1991;265(21):2821–2825.
 39. Klevan JL, Weiss JC, Dabrow SM. Pregnancy during pediatric residency. Attitudes and complications. *Am J Dis Child*. 1990;144(7):767–769.
 40. Lashbrook DL, Frazier LM, Horbelt DV, Stemberidge TW, Rall MJ. Pregnancy during obstetrics and gynecology residency: effect on surgical experience. *Am J Obstet Gynecol*. 2003;189(3):662–665. [http://dx.doi.org/10.1067/S0002-9378\(03\)00877-9](http://dx.doi.org/10.1067/S0002-9378(03)00877-9).
 41. Lerner LB, Stolzmann KL, Gulla VD. Birth trends and pregnancy complications among women urologists. *J Am Coll Surg*. 2009;208(2):293–297. <http://dx.doi.org/10.1016/j.jamcollsurg.2008.10.012>.
 42. Lerner LB, Baltrushes RJ, Stolzmann KL, Garshick E. Outcomes/epidemiology/socio economics satisfaction of women urologists with maternity leave and childbirth timing. *JURO*. 2010;183(1):282–286. <http://dx.doi.org/10.1016/j.juro.2009.08.113>.
 43. Manaster BJ, Hulen R. Pregnancy and maternity policies in radiology residencies: the 1993 survey of the American Association for Women Radiologists. *Acad Radiol*. 1995;2(9):804–806.
 44. Mayer KL, Ho HS, Goodnight JE. Childbearing and child care in surgery. *Arch Surg*. 2001;136(6):649–655.
 45. McPhillips HA, Burke AE, Sheppard K, Pallant A, Stapleton FB, Stanton B. Toward creating family-friendly work environments in pediatrics: baseline data from pediatric department chairs and pediatric program directors. *PEDIATRICS*. 2007;119(3):e596–e602. <http://dx.doi.org/10.1542/peds.2006-2397>.
 46. Miller NH, Miller DJ, Chism M. Breastfeeding practices among resident physicians. *PEDIATRICS*. 1996;98(3 Pt 1):434–437.
 47. Orth TA, Drachman D, Habak P. Breastfeeding in obstetrics residency: exploring maternal and colleague resident perspectives. *Breastfeed Med*. 2013;8(4):394–400. <http://dx.doi.org/10.1089/bfm.2012.0153>.
 48. Osborn LM, Harris DL, Reading JC, Prather MB. Outcome of pregnancies experienced during residency. *J Fam Pract*. 1990;31(6):618–622.
 49. Pham DT, Stephens EH, Antonoff MB, et al. Birth trends and factors affecting childbearing among thoracic surgeons. *Ann Thorac Surg*. 2014;98(3):890–895. <http://dx.doi.org/10.1016/j.athoracsur.2014.05.041>.
 50. Phelan ST. Pregnancy during residency: I. The decision “to be or not to be”. *Obstet Gynecol*. 1988;72(3 Pt 1):425–431.
 51. Phelan ST. Pregnancy during residency: II. Obstetric complications. *Obstet Gynecol*. 1988;72(3 Pt 1):431–436.
 52. Phelan EA. A survey of maternity leave policies in Boston area hospitals. *J Am Med Womens Assoc*. 1991;46(2):55–58.
 53. Phelan ST. Sources of stress and support for the pregnant resident. *Acad Med*. 1992;67(6):408–410.
 54. Philibert I, Bickel J. Maternity and parental leave policies at COTH hospitals: an update. Council of Teaching Hospitals. *Acad Med*. 1995;70(11):1056–1058.
 55. Pincus S. Women in academic dermatology. Results of survey from the professors of dermatology. *Arch Dermatol*. 1994;130(9):1131–1135.
 56. Riggins C, Rosenman MB, Szucs KA. Breastfeeding experiences among physicians. *Breastfeed Med*. 2012;7(3):151–154. <http://dx.doi.org/10.1089/bfm.2011.0045>.
 57. Rodgers C, Kunkel ES, Field HL. Impact of pregnancy during training on a psychiatric resident cohort. *J Am Med Womens Assoc*. 1994;49(2):49–52.
 58. Rose SH, Burkle CM, Elliott BA, Koenig LF. The impact of parental leave on extending training and entering the board certification examination process: a specialty-based comparison. *Mayo Clin Proc*. 2006;81(11):1449–1453. <http://dx.doi.org/10.4065/81.11.1449>.
 59. Sandler BJ, Tackett JJ, Longo WE, Yoo PS. Pregnancy and parenthood among surgery residents: results of the first nationwide survey of general surgery residency program directors. *J Am Coll Surg*. January 2016:1–7. <http://dx.doi.org/10.1016/j.jamcollsurg.2015.12.004>.
 60. Sayres M, Wyshak G, Denterlein G, Apfel R, Shore E, Federman D. Pregnancy during residency. *N Engl J Med*. 1986;314(7):418–423. <http://dx.doi.org/10.1056/NEJM198602133140705>.
 61. Shapiro J. Children during residency: it's easier if you're a man. *J Am Med Womens Assoc*. 1981;36(7):227–231.
 62. Shapiro J. Pregnancy during residency: attitudes and policies. *J Am Med Womens Assoc*. 1982;37(4):96–7–101–3.
 63. Shapiro J. Attitudes of physician faculty members and residents toward the pregnant medical resident. *J Med Educ*. 1982;57(6):483–486.
 64. Shaw PM, Vouyouka A, Reed A. Time for radiation safety program guidelines for pregnant trainees and vascular surgeons. *YMVA*. 2012;55(3):862–868. <http://dx.doi.org/10.1016/j.jvs.2011.11.045>. e862.
 65. Sheth S, Freedman MT, Arak G. Policies and attitudes toward the pregnant radiology resident. *Investig Radiol*. 1985;20(4):413–415.
 66. Sinal S, Weavil P, Camp MG. Survey of women physicians on issues relating to pregnancy during a medical career. *J Med Educ*. 1988;63(7):531–538.
 67. Smith C, Galante JM, Pierce JL, Scherer LA. The surgical residency baby boom: changing patterns of childbearing during residency over a 30-year span. *J Graduate Med Educ*. 2013;5(4):625–629. <http://dx.doi.org/10.4300/JGME-D-12-00334.1>.
 68. Tucker JB, Margo KL. Profile of women family practice residents. *Fam Med*. 1987;19(4):269–271.
 69. Turner PL, Lumpkins K, Gabre J, Lin MJ, Liu X, Terrin M. Pregnancy among women surgeons. *Arch Surg*. 2012;147(5). <http://dx.doi.org/10.1001/archsurg.2011.1693>.
 70. Verheyden CN, McGrath MH, Simpson P, Havens L. Social problems in plastic surgery residents. *Plast Reconstr Surg*. 2015;135(4):772e–778e. <http://dx.doi.org/10.1097/PRS.0000000000001098>.
 71. Willett LL, Wellons MF, Hartig JR, et al. Do women residents delay childbearing due to perceived career threats? *Acad Med*. 2010;85(4):640–646. <http://dx.doi.org/10.1097/ACM.0b013e3181d2cb5b>.
 72. Wilson MD, Carpenter RO, Radius SM, Oski FA. Attitudes and factors affecting the decisions of men and women pediatric residents toward having children during their residencies. *Acad Med*. 1991;66(12):770–772.
 73. Windsor AM, Julian TM. Sexuality, reproduction, and contraception among residents in obstetrics and gynecology. *Obstet Gynecol*. 1995;85(5 Pt 1):787–792.
 74. Statement on the importance of parental leave. *Bull Am Coll Surg*. 2016;101(4):35–36.
 75. Cohen D. Facebook Offers All Employees 4 Months' Parental Leave. Published. AdWeek; December 1, 2015. <http://www.adweek.com/digital/four-months-parental-leave/>. Accessed 8 February 2017.
 76. Tepper T. Amazon's parental leave: the new free Soda? Money. Published <http://time.com/money/4098026/amazon-paid-parental-leave-benefits/>; November 3, 2015. Accessed 8 February 2017.
 77. Tepper T. The pros and cons of Netflix's new parental leave plan. <http://time.com/money/3985632/netflix-unlimited-parental-leave/>; August 2015.
 78. Ferdinand L. Carter Announces 12 Weeks Paid Military Maternity Leave, Other Benefits. *U.S. Department of Defense*. Published; January 28, 2016. <https://www.defense.gov/News/Article/Article/645958/carter-announces-12-weeks-paid-military-maternity-leave-other-benefits>. Accessed 8 February 2017.
 79. Brown EG, Galante JM, Keller BA, Braxton J, Farmer DL. Pregnancy-related attrition in general surgery. *JAMA Surg*. 2014;149(9):893. <http://dx.doi.org/10.1001/jamasurg.2014.1227>.
 80. The American Board of Plastic Surgery. *Inc*. May 2016:1–92.
 81. Bluth M. *The General Surgery Milestone Project*. July 2015:1–19.
 82. McGrath MH. The plastic surgery milestone project. *J Graduate Med Educ*. 2014;6(1s1):222–224. <http://dx.doi.org/10.4300/JGME-06-01s1-25>.