



Supporting Information

Supplementary tables

**This appendix was part of the submitted manuscript and has been peer reviewed.
It is posted as supplied by the authors.**

Appendix to: Hoffman R, Mullan J, Nguyen M, Bonney AD. Motherhood and medicine: systematic review of the experiences of mothers who are doctors.
Med J Aust 2020; doi: 10.5694/mja2.50747.

Table 1. Search strategy for our systematic review

Search ID	Search terms	Search options	Last run via	Results
S6	("Family work relationships" OR "work life balance" OR "work home culture") AND (S4 AND S5)	Expanders: Apply equivalent subjects Search modes: Find all my search terms	Interface: EBSCOhost research databases Search screen: Advanced search Database: MEDLINE with full text	146
S5	"Family work relationships" OR "work life balance" OR "work home culture"	Expanders: Apply equivalent subjects Search modes: Find all my search terms	Interface: EBSCOhost research databases Search screen: Advanced search Database: MEDLINE with full text	1274
S4	(family OR child* OR Mother* OR Parent*) AND (S1 AND S2 AND S3)	Expanders: Apply equivalent subjects Search modes: Find all my search terms	Interface: EBSCOhost research databases Search screen: Advanced search Database: MEDLINE with full text	102 316
S3	family OR child* OR Mother* OR Parent*	Expanders: Apply equivalent subjects Search modes: Find all my search terms	Interface: EBSCOhost research databases Search screen: Advanced search Database: MEDLINE with full text	3 789 009
S2	doctor* OR physician* OR clinician*	Expanders: Apply equivalent subjects Search modes: Find all my search terms	Interface: EBSCOhost research databases Search screen: Advanced search Database: MEDLINE with full text	855 275
S1	Female OR Women	Expanders: Apply equivalent subjects Search modes: Find all my search terms	Interface: EBSCOhost research databases Search screen: Advanced search Database: MEDLINE with full text	8 601 524

Table 2. Motherhood: the impact of being a doctor on raising children

Study	Year	Country	Design	Focus	Participants	Key findings
Hill ¹¹	2018	USA	Quantitative survey	Timing and family size	677 doctors	83% of women reported that career affected the timing of having children
Bering ¹²	2018	USA	Quantitative survey	Deferred personal life decisions of women doctors	801 doctors	Children/marriage deferments were reported by 64% of participants; of these, 86% reported waiting to have children
Kawase ⁸	2018	Japan	Quantitative survey	Priorities of personal lives of Japanese surgeons	6211 surgeons	Men prioritised work over family, women prioritised family over work. Both men and women placed the importance of women with the family.
Lambert ¹³	2017	UK	Quantitative survey	Impact of having children on specialty choice	2057 doctors	Plans for family influenced specialty choice of 47% of participants.
Reimann ¹⁰	2017	Germany	Qualitative	Choice to be a mother or a doctor	20 female doctors	Female doctors needed to choose between a career and a family.
Mattessich ¹⁴	2017	USA	Quantitative survey	Women dermatologist's career options	183 dermatologists	93% of women took less than 12 weeks maternity leave; 25% took less than 4 weeks.
Shanafelt ¹⁵	2016	USA	Quantitative survey	Parental satisfaction	6880 doctors	37% of participants believed that their career had a negative impact on relationship with their child
Chen ¹⁶	2013	USA	Quantitative survey	Effects of marriage and childbirth on residents.	4028 residents	Women who had a first child during PGY1–3 were more likely to feel overwhelmed and worry about financial security.
Sullivan ¹⁷	2013	USA	Quantitative survey	Marital status and child rearing impacts on residency	4402 residents	Having children in residency increased family strain.
Estryn-Behar ¹⁸	2011	France	Quantitative survey	Barriers by career to parenthood	1924 doctors	41.3% of female doctors saw their profession as an obstacle to having children (v 19.3% for men).
Farahat ¹⁹	2009	Egypt	Quantitative	Explore challenges facing women doctors in Egypt	300 doctors	Female doctors who worked alternating shifts have more difficulty balancing family life and career development.

PGY = postgraduate year.

Table 3. Medicine: the impact of being a mother on a medical career

Study	Year	Country	Design	Focus	Participants	Key findings
Lopez Leon ²⁰	2019	Latin America	Quantitative survey	Choice of specialty on childbearing	1241 women doctors	Women were more likely to choose generalist (ie, paediatrics/geriatrics, family medicine) specialties
Ly ²¹	2018	USA	Quantitative survey	Time spent on household activities	565 doctors	Women spend 100 more hours per day on household based and childcare activities than males with the same career
Halley ²²	2018	USA	Analysis of survey responses	Mothers' experiences of workplace discrimination	947 doctors	Discrimination was experienced by women doctors based on their status as a mother.
Kawase ⁸	2018	Japan	Quantitative survey	Priorities of personal lives of Japanese surgeons	6211 surgeons	Males prioritise work above family. Both males and women place the importance of mothers with the family.
Attieh ²³	2018	Lebanon	Quantitative survey	Pregnancy in residency	89 residents 11 department heads	47% perceived that a pregnant colleague was less productive and adds to their workload. Almost half of program directors (45%) took pregnancy or pregnancy plans negatively into consideration when hiring residents.
Umoetok ²⁴	2017	South Africa	Quantitative survey	Impact of gender on training and practice of surgery	32 women surgeons	53% perceive that they were treated differently because of their sex.
Baptiste ²⁵	2017	USA	Quantitative survey	Work life balance and role responsibility	127 faculty, 116 trainees	Women doctors were more likely to be primarily responsible for childcare planning, meal planning, grocery shopping, and vacation planning.
Lambert ¹³	2017	UK	Quantitative survey	Impact of having children on specialty choice	2057 doctors	47% reported that their specialty choice was based upon their plans for a family.
Mundschenk ²⁶	2016	USA	Quantitative survey	Supportiveness of pregnancy in residency	203 women doctors	Administrative and policy support for pregnancy has improved since the last survey in 2008.
Fujimaki ²⁷	2016	Japan	Quantitative survey	Women neurosurgeons and life events	244 neurosurgeons, 469 chiefs	Post-partum, 22% had been able to take childcare leave. 11% had quit their full-time job due to parenting responsibilities.
Lachish ²⁸	2016	UK	Quantitative survey	Factors impacting working less than fulltime as a doctor	10,866 doctors	42% women, 7% men work less than full time. Having children was the single largest reason for working less than full time.
Kawase ²⁹	2016	Japan, USA, Finland, Hong Kong	Quantitative survey	Career barriers faced by women surgeons	225 surgeons	Sex discrimination, lack of family support, and work-life balance were perceived as barriers to women reaching leadership positions in surgery
Knieper ³⁰	2014	Germany	Quantitative survey	Pregnancy an operating	164 women doctors	Policies in German hospitals discouraged pregnant women from working in surgery

Study	Year	Country	Design	Focus	Participants	Key findings
Schueller-Weidekamm ³¹	2012	Germany	Qualitative	Work life balance in leadership	8 women doctors in leadership positions	Women felt they were primarily responsible for childcare.
Stamm ³²	2011	Switzerland	Quantitative survey	Family structures of doctors and impact on career	414 doctors	Most doctors (79.8%) had gender-traditional male lead career family roles. Starting a family slows a women's career.
Pas ³³	2011	Netherlands	Quantitative survey	Does having children effect career motivation	1070 women doctors	Neither having children, nor the age of the youngest child affects career motivation.
Buddeberg-Fischer ³⁴	2010	Switzerland	Quantitative survey	Impact of becoming a parent on career	579 doctors	Women doctors with children work reduced hours, mainly to enable them to fit in family responsibilities.
Farahat ¹⁹	2009	Egypt	Quantitative	Explore challenges facing women doctors in Egypt	300 doctors	Balancing family life and career development has been reported as challenging by doctors who work on an alternating shift basis.

Table 4. Combining motherhood and medicine: strategies and policies

Study	Year	Country	Design	Focus	Participants	Key findings
Rangel ³⁵	2018	USA	Thematic analysis of open-ended survey responses	Perspectives of pregnancy and surgery	219 surgical residents	Inadequate maternity leave policies, perceived need for more support from workplace
Morris ³⁶	2018	USA	Quantitative survey	Parenting support programs	297 program directors	Less than half of the program directors thought that their support systems were adequate in terms of parenting support programs
Rangel ³⁷	2018	USA	Quantitative survey	Pregnancy in surgical training	347 women surgeons	78.4% of women took less than 6 weeks leave due to current policies.
Garza ³⁸	2017	USA	Quantitative survey	Policies for plastic surgery residents	54 plastic surgery directors	36% of programs had a formal maternity leave policy
Mattessich ¹⁴	2017	USA	Quantitative survey	Women dermatologist's career options	183 dermatologists	93% of women took less than 12 weeks maternity leave, with 25% taking less than 4 weeks, due to current policies.
Arima ³⁹	2016	Japan	Quantitative survey	Work life balance	439 doctors	Communication and salary satisfaction linked to better work life balance, as did mentoring/teaching others
Morris ⁴⁰	2016	USA	Qualitative	Competing demands as a parent and a resident	8 residents	Participants perceived that residency programs contributed to competing demands, especially for parents. They believed supportive policies at work were able to reduce stress
Weiss ⁴¹	2016	USA	Quantitative survey	Orthopaedic policies for maternity/paternity/adoption leave	45 program directors	No uniform policy nationwide, most programs for leave were not/underutilised (3 or fewer known trainees using policy).
Knieper ³⁰	2014	Germany	Quantitative survey	Pregnancy and surgery	164 women doctors	Policies in German hospitals discouraged pregnant women from working in surgery
Schueller-Weidekamm ³¹	2012	Germany	Qualitative	Work-life balance in leadership	8 women doctors in leadership positions	Work strategies such as; mentoring, coaching and networking helped to support a better work-life balance
Pas ⁴²	2011	Netherlands	Quantitative survey	Human resources strategies for doctors with children	483 doctors	Offering family friendly strategies to allow women to remain in the workforce had a positive outcome on workable hours post-partum.
Berkowitz ⁴³	2010	USA	Quantitative survey	Family friendly benefits in the workplace	546 doctors	98% women worked in a full-time capacity, however, 21% were interested in a part time position, and did not hold one due to limited workplace flexibility and policies

References

- 8 Kawase K, Nomura K, Tominaga R, et al. Analysis of gender based differences among surgeons in Japan: results of a survey conducted by the Japan Surgical Society. Part 2: personal life. *Surg Today* 2018; 48: 308-319.
- 10 Reimann S, Alfermann D. Female doctors in conflict: how gendering processes in German hospitals influence female physicians' careers. *Gender Issues* 2018; 35: 52-70.
- 11 Hill EK, Stuckley A, Fiascone S, et al. Gender and the balance of parenting and professional life among gynaecology subspecialists. *J Minim Invasive Gynecol* 2019; 26: 1088-1094.
- 12 Bering J, Pflibsen L, Eno C, Radhakrishnan P. Deferred personal life decisions of women physicians. *J Womens Health (Larchmt)* 2018; 27: 584-589.
- 13 Lambert TW, Smith F, Goldacre MJ. Combining parenthood with a medical career: questionnaire survey of the UK medical graduates of 2002 covering some influences and experiences. *BMJ Open* 2017; 7: e016822.
- 14 Mattessich S, Shea K, Whitaker-Worth D. Parenting and female dermatologists' perceptions of work-life balance. *Int J Womens Dermatol* 2017; 3: 127-130.
- 15 Shanafelt TD, Hasan O, Hayes S, et al. Parental satisfaction of US physicians: associated factors and comparison with the general US working population. *BMC Med Educ* 2016; 16: 228.
- 16 Chen MM, Yeo HL, Roman SA, et al. Life events during surgical residency have different effects on women and men over time. *Surgery* 2013; 154: 162-170.
- 17 Sullivan MC, Yeo H, Roman SA, et al. Striving for work-life balance effect of marriage and children in the experience of 4402 US general surgery residents. *Ann Surg* 2013; 257: 571-576.
- 18 Estryn-Behar M, Fry C, Guetarni K, et al. Work week duration, work-family balance and difficulties encountered by female and male physicians: results from the French SESMAT study. *Work* 2011; 40: S83-S100.
- 19 Farahat FM. Challenges facing female physicians in Egypt. *Arch Environ Occup Health* 2009; 64: 121-128.
- 20 Lopez Leon L, Del Valle CA, Salceda AH, et al. Medical careers and motherhood: a cross-sectional study of Hispanic female physicians. *J Grad Med Educ* 2019; 11 (4 Suppl): 181-185.
- 21 Ly DP, Jena AB. Sex differences in time spent on household activities and care of children among US physicians, 2003-2016. *Mayo Clin Proc* 2018; 93: 1484-1487.
- 22 Halley MC, Rustagi AS, Torres JS, et al. Physician mothers' experience of workplace discrimination: a qualitative analysis. *BMJ* 2018; 363: k4926
- 23 Attieh E, Maalouf S, Chalfoun C, et al. Impact of female gender and perspectives of pregnancy on admission in residency programs. *Reprod Health* 2018; 15: 121.
- 24 Umeotok F, Van Wyk JM, Madiba TE. Does gender impact on female doctors' experiences in the training and practice of surgery? A single centre study. *South African J Surg* 2017; 55: 8-12.
- 25 Baptiste D, Fecher AM, Dolejs SC, et al. Gender differences in academic surgery, work-life balance, and satisfaction. *J Surg Res* 2017; 218: 99-107.
- 26 Mundschenk MB, Krauss EM, Poppler LH, et al. Resident perceptions on pregnancy during training: 2008 to 2015. *Am J Surg* 2016; 212: 649-659.
- 27 Fujimaki T, Shibui S, Kato Y, et al. Working conditions and lifestyle of female surgeons affiliated to the Japan Neurosurgical Society: findings of individual and institutional surveys. *Neurol Med Chir* 2016; 56: 704-708.
- 28 Lachish S, Svirko E, Goldacre MJ, Lambert T. Factors associated with less than full-time working in medical practice: results of surveys of five cohorts of UK doctors, 10 years after graduation. *Hum Resour Health* 2016; 14: 62.

- 29 Kawase K, Carpelan-Holmström M, Kwong A, Sanfey H. Factors that can promote or impede the advancement of women as leaders in surgery: results from an international survey. *World J Surg* 2016; 40: 258-266.
- 30 Kneiper C, Ramsauer B, Hancke K, et al. “Pregnant and operating”. Evaluation of a Germany-wide survey among female gynaecologists and surgeons. *Geburtshilfe Frauenheilkd* 2014; 74: 875-880.
- 31 Schueller-Weidekamm C, Kautzy-Willer A. Challenges of work–life balance for women physicians/mothers working in leadership positions. *Gend Med* 2012; 9: 244-250.
- 32 Stamm M, Biddeberg-Fischer B. How do physicians and their partners co-ordinate their careers and private lives? *Swiss Med Wkly* 2011; 141: w13179.
- 33 Pas B, Peters P, Eisinga R, et al. Explaining career motivation among female doctors in the Netherlands: the effect of children, views on motherhood and work-home cultures. *Work Employment Society* 2011; 25: 487-505.
- 34 Buddeberg-Fischer B, Stamm M, Buddeberg C, et al. The impact of gender and parenthood on physicians’ careers: professional and personal situation seven years after graduation. *BMC Health Serv Res* 2010; 10: 40.
- 35 Rangel EL, Castillo-Angeles M, Changala M, et al. Perspectives of pregnancy and motherhood among general surgery residents: a qualitative analysis. *Am J Surg* 2018; 216: 754-759.
- 36 Morris LE, Lindbloom E, Kruse RL, et al. Perceptions of parenting residents among family medicine residency directors. *Fam Med* 2018; 50: 756-762.
- 37 Rangel EL, Smink DS, Castillo-Angeles M, et al. Pregnancy and motherhood during surgical training. *JAMA Surg* 2018; 153: 644-652.
- 38 Garza RM, Weston JS, Furnas HJ. Pregnancy and the plastic surgery resident. *Plas Reconstr Surg* 2017; 139: 245-252.
- 39 Arima M, Araki Y, Iseki S, et al. Seeking a “career” and “family”: factors of satisfaction in work–life balance among child-rearing female physicians in Japan, comparison between female physicians without children and male physicians. *Health Sci J* 2016; 10(4): 16.
- 40 Morris L, Cronk NJ, Washington KT. Parenting during residency: providing support for Dr mom and Dr dad. *Fam Med* 2016; 48: 140-144.
- 41 Weiss J, Teuscher D. What provisions do orthopaedic programs make for maternity, paternity and adoption leave? *Clin Orthop Relat Res* 2016; 474: 1945-1949.
- 42 Pas B, Peters P, Doorewaard H, et al. Feminisation of the medical profession: a strategic HRM dilemma? The effects of family-friendly HR practices on female doctors’ contracted working hours. *Hum Resour Manag J* 2011; 21: 285-302.
- 43 Berkowitz CD, Frintner MP, Cull WL. Pediatric resident perceptions of family-friendly benefits. *Acad Pediatr* 2010; 10: 360-366.