

# BMJ Open The difficulty of professional continuation among female doctors in Japan: a qualitative study of alumnae of 13 medical schools in Japan

Kyoko Nomura,<sup>1</sup> Yuka Yamazaki,<sup>2</sup> Larry D Gruppen,<sup>3</sup> Saki Horie,<sup>4</sup> Masumi Takeuchi,<sup>4</sup> Jan Illing<sup>5</sup>

**To cite:** Nomura K, Yamazaki Y, Gruppen LD, *et al*. The difficulty of professional continuation among female doctors in Japan: a qualitative study of alumnae of 13 medical schools in Japan. *BMJ Open* 2015;5:e005845. doi:10.1136/bmjopen-2014-005845

► Prepublication history for this paper is available online. To view these files please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2014-005845>).

Received 4 June 2014  
Revised 19 February 2015  
Accepted 1 March 2015



CrossMark

For numbered affiliations see end of article.

**Correspondence to**  
Dr Kyoko Nomura;  
[kyoko@med.teikyo-u.ac.jp](mailto:kyoko@med.teikyo-u.ac.jp)

## ABSTRACT

**Objectives:** To investigate the difficulties Japanese female doctors face in continuing professional practice.

**Design:** A qualitative study using the Kawakita Jiro method.

**Setting:** A survey conducted in 2011 of 13 private Japanese medical school alumni associations.

**Participants:** 359 female doctors.

**Primary outcome measures:** Barriers of balancing work and gender role.

**Results:** The female doctors reported that professional practice was a struggle with long working hours due to a current shortage of doctors in Japan. There was also a severe shortage of childcare facilities in the workplace. Some women appeared to have low confidence in balancing the physician's job and personal life, resulting in low levels of professional pursuit. There appeared to be two types of stereotypical gender roles, including one expected from society, stating that "child rearing is a woman's job", and the other perceived by the women themselves, that some women had a very strong desire to raise their own children. Male doctors and some female doctors who were single or older were perceived to be less enthusiastic about supporting women who worked while raising children because these coworkers feared that they would have to perform additional work as a result of the women taking long periods of leave.

**Conclusions:** Important factors identified for promoting the continuation of professional practice among female doctors in Japan were the need to improve working conditions, including cutting back on long working hours, a solution to the shortage of nurseries, a need for the introduction of educational interventions to clarify professional responsibilities, and redefinition of the gender division of labour for male and female doctors. In addition, we identified a need to modernise current employment practices by introducing temporary posts to cover maternity leave and introducing flexible working hours during specialist training, thus supporting and encouraging more women to continue their medical careers.

## INTRODUCTION

According to the Global Gender Gap Report 2013, of 135 countries, Japan was ranked 105th on gender equality,<sup>1</sup> female participation

## Strengths and limitations of this study

- A qualitative study based on 359 female doctors revealed that barriers of balancing work and gender role were mainly poor working conditions, including long working hours due to a physician shortage, nursery shortage and stereotypical gender role.
- There appeared to be two types of stereotypical gender roles, including one expected from society, stating "child rearing is a woman's job", and the other perceived by the women themselves, that some women had a very strong desire to raise their own children.
- Male doctors and some female doctors who were single or older were perceived to be less enthusiastic about supporting women who worked while raising children because these coworkers feared that they would have to perform additional work as a result of the women taking long periods of leave.
- The limitation of this study includes textual analyses using the Kawakita Jiro method, which may not have thematically saturated data.

in the labour force and political participation (ie, percentage of women in parliament, ministerial positions), and has the lowest percentage of females in the workforce among the Organisation for Economic Co-operation and Development (OECD) countries.<sup>2</sup> The number of female doctors in Japan today is comparable with that in the US over 20 years ago, with only 18.9% (55 897) of all physicians<sup>3</sup> being female. Given the critical shortage of doctors in Japan, it is worth considering why there are so few female doctors practicing and what can be done to increase this number.

Previous research has shown that female doctors in Japan work fewer hours, retire earlier and are more likely to be professionally inactive, compared with their male counterparts.<sup>4</sup> A survey of 711 Japanese female doctors revealed that 55% had resigned from full-time positions at least once, and only

30% of these women returned to full-time employment.<sup>5</sup> It is known that women in Japan often stop working while in their 30s, after having had children, and then return to the workforce after they have finished raising their children. This work pattern, which has been described as an “M-shaped curve” representing rates of participation in the labour force by age, is characterised by peaks in the early 20s and late 40s, combined with a trough in the early 30s.<sup>6</sup>

This pattern has, interestingly, not been observed in any country other than Japan and Korea. Indeed, such low participation among the younger female generation may not be fully explained by childrearing. First, gender role stereotyping is embedded into the Japanese cultural systems, beliefs and behaviours; meaning that men and women tend to follow their specific gender roles, and that women believe they should stay at home to take care of family responsibilities while men should go out to work. According to a public opinion survey conducted by the Japanese government in 2013,<sup>7</sup> 50% of respondents in their 20's agreed with the stereotyping gender role while 46.6% disagreed and the rest answered that they did not know. Second, in our previous study based on 1684 female doctors, we demonstrated that more women than men significantly experienced gender discrimination related to professional advancement,<sup>8</sup> and doctors with the strongest perception of gender-based career obstacles were more likely to work part time rather than full-time.<sup>9</sup>

Hence we attempted to explore the factors that make it difficult for female doctors to balance professional development with gender role responsibilities using a qualitative approach.

## METHODS

### Subjects

This cross-sectional study was based on a survey of alumnae who had previously trained at 1 of 13 private medical schools. The study was conducted between June 2009 and May 2011. Japan has 80 medical schools, 29 of which are private. The present study was jointly sponsored by the Council of Private Medical School Alumni Associations, the Ministry of Education, Science, Sports and Culture, Grant in Scientific Research and the Pfizer Health Research Foundation, and targeted at female doctors.

The aim was to identify the challenges of having a good work–life balance. All of the 18 schools in the eastern region of Japan were targeted, and 13 agreed to participate in the study. In total, there were 9544 alumnae registered in the 13 alumni associations. We sent an invitation letter to these women via email. The exact response rate is difficult to determine as many of the emails were no longer used; however, 2029 alumnae responded with written informed consent to take part in the study. Of those that agreed to take part, 1684 answered a self-administered questionnaire (response rate to the informed consent: 83%).

We included a single open-ended question soliciting participants' thoughts about the challenges of balancing professional work development with gender role responsibilities. The question had no word or page count limit. The questionnaire also included basic demographics, marital status, number of children, work status (ie, full-time/part time/unemployed), work site (university hospital/hospital/clinics/others) and questions about any experience of gender inequality in career opportunities, and questions about any perception of gender-based obstacles.

The study protocol was approved by the Institutional Review Board of Teikyo University School of Medicine (No. 08-107).

### Theoretical perspective

Our study draws on a constructivist perspective, recognising that this study considers the social constructions and meaning-making of the study participants, and as researchers we bring our own interpretation reflecting that some of us are trainees and others are senior clinicians, male and female, and living within the same culture as the study participants, and others of us are non-clinicians, with a gender mix, living outside Japan in a western culture.<sup>10</sup> We recognise that we are involved in the process of making new social constructions that result from the perspective of the researcher as well as the research object to form new constructions.<sup>11</sup>

### Kawakita Jiro method

The responses to the open-ended question were analysed qualitatively using the Kawakita Jiro (KJ) method,<sup>12</sup> also called an affinity diagram, which was developed by Jiro Kawakita (a Japanese anthropologist). It helps to synthesise large amounts of data by finding relationships between ideas, and is suited to a constructivist perspective.

Six researchers including two coauthors (KN and YK) and two male medical students of different ages, marital and employment status, analysed the data. First, we all initially reviewed respondents' comments as a working group and divided the comments into 1322 fragments, each of which had only a single meaning (eg, miscarriage following long working hours, depression following over work); these were recorded individually on cards. Second, we spread the cards out on a table and grouped them according to the similarity of the comments they presented or the context in which they appeared in the initial transcript (eg, poor working conditions). Third, we discussed the shared meaning of each of the sorted groups, and wrote the main theme description for each group on a blank card and placed this at the top of its respective group. Following this, we grouped the themes until we had reached the broadest, but still meaningful, category. Fourth, we drew lines connecting the themes using an interactive process of discussion and consensus. If anyone disagreed, we negotiated around a provisional domain of categories. This process continued until all the data were classified under one of the categories.

Every process was performed together by the six researchers. The quotes given are reproduced exactly as written by our participants except where indicated as authors' clarification in square brackets.

## RESULTS

### Participant characteristics

Of the 1684 participants who returned questionnaires, this analysis focused on the 359 (21%) who provided answers to the open-ended question about continuing to work and deal with the challenges of developing their careers; 78% of this group were married, 91% were working as clinical physicians at the time of the study, 60% worked full-time, 35% worked part time and 264 (74%) had children. The median age (interquartile range) was 45 years and the age range was from 38 to 53 years.

### Overview of qualitative analysis

The KJ method yielded five domains:

1. Poor working condition with inadequate child support (184 cards)
2. Low levels of professional pursuit (96 cards)
3. Lack of understanding in the workplace; and harassment (132 cards)
4. Stereotypical gender roles (255 cards)
5. A switch from full-time to part time labour and consequent career stagnation (157 cards)

Below we describe the factors that these female doctors identified as barriers to their professional development while also having stereotypical gender role responsibilities, and discuss how these factors are related to reduced involvement in work and subsequent career stagnation.

#### Poor working condition with poor child support

##### *Long working hours resulting in a subsequent occupational health hazard*

Medical workforce shortages result in men and women having to work long hours and having to agree to working frequent night shifts. In this study (excluding those who were unemployed), the median weekly working hour was 70 h with IQRs from 50 to 80 h among the 152 women in their 20's, which far exceeds the 40 h/week that comprises the maximum working hours regulated by the Japanese Labor Standards Act (Article 32). Respondents pointed out that such long working hours resulted in occupational health hazards.

As the result of my hard work, including night shifts even during pregnancy, I experienced a near miscarriage and had no choice but to resign. (part time, 46 years, married)

When I experienced a near miscarriage with my second child, I had to work long hours. People at my workplace did not adjust my shift schedule. (anonymous)

I have been suffering from depression for 5 years due to overwork. (part time, 42 years, married)

#### *Lack of childcare facilities at work*

Many of our respondents claimed that the number of childcare facilities, including those that care for a sick child, were inadequate in the workplace. Two respondents suggested that increased availability of childcare facilities may increase the participation of women in the workforce.

If my workplace had provided me with a child-care facility, including one that would care for a sick child, I could have afforded to work full-time when my children were little. (full-time, 69 years, divorced)

Whenever my children have a fever, I am always called by the childcare facility to pick up my kid. I wish that my workplace had a child-care facility for sick children. (full-time, 50 years, married)

#### *Low levels of professional pursuit*

Two single women and an older female doctor, who had pioneering spirits, as they continued to work while raising children, suggested that some women tend to be too passive in their career development and leave the workplace too easily.

Female doctors from younger generations do not work very hard and do not pursue careers. I have had a very hard time balancing my work and child rearing. I never used my children as an excuse for my work but worked as much as or even harder than my male peers did. (full-time, 56 years, divorced)

Female doctors with children sometimes claim that their workloads should be reduced because they have family responsibilities. I do not think it is fair. Once you became a doctor, you should fulfil your responsibility to serve patients. (full-time, 45 years, single)

I do not know why some female doctors become pregnant very easily soon after they belong to a clinical department at hospitals where they are expected to work very hard. (full-time, 36 years, single)

Here are examples of women who seemed to have low motivation for a professional career and, sadly, some who have attitudes in stark contrast to the ones above. Some women appeared to have low confidence in balancing a physician's job and personal life, resulting in low levels of professional pursuit.

It is very difficult to seek promotion while fulfilling family responsibilities. My friends and I think it is a good idea to catch a man physician who will be a good candidate for a professorship and to enjoy life overseas while he studies abroad. (full-time, 49 years, married)

Because my husband will open a private clinic in the future, I will help to run a clinic. To be honest, my career is not important. (part time, 43 years, married)

### Lack of understanding in the workplace; and harassment

The respondents identified two aspects of a lack of workplace support: (1) a lack of understanding from male and female colleagues, and (2) harassment.

#### *Lack of understanding from male and female doctors*

A lack of understanding at the workplace from men and some women was associated with fears about the extra work incurred when women took long periods of leave due to life events.

It is unfair that only female doctors who have children are allowed to take such a long absence from work. (part time, 50 years, married)

Male doctors at my workplace do not want to help female colleagues who insist that they cannot afford to work because of family responsibilities. (full-time, 35 years, single)

Because there are few OBs & GYNs specialists at my university hospital, the workload of each medic is tremendously heavy. So, I just can't say, 'I want to take any long leave because of women's life events.' (part time, 41 years, married)

#### *Harassment*

The harassment reported here included unwanted and annoying actions from one party or group, including threats and demands, and appeared to be caused by offenders' fears that they would have to perform additional work as a result of women taking long periods of leave.

I was laid off by my boss when I told him that I claimed the right to take parental leave. My boss said, 'Your taking maternal leave will add an additional work burden to others. I prefer to give your salaried position to others.' (work schedule unknown, 39 years, married)

I resigned from full-time work because of harassment from male doctors. Even though people at my workplace knew that I had children, I was forced to work and take night shifts as much as my male peers did. (full-time, 56 years, divorced)

#### *Stereotypical gender roles*

It was clear that some women accepted that the caring role was theirs and theirs alone and had little or no expectation of sharing it with their partners or others.

#### *Gender-related role expectations from others*

Women have to take care of not only children but also the elderly. (full-time, 43 years, divorced)

Child rearing is women's social responsibility. (full-time, 48 years, single)

The reason I am unemployed is not a matter of my career but involves the need to provide support for my husband until he becomes a professor. It is not because

of biological sex but because of gender roles; it is very hard for female doctors to work as much as their male peers do. (unemployed, 45 years, married)

#### *Desire to rear their children themselves*

This study showed that gender role expectation from others strongly prevailed, even among female doctors, but also showed that some women had a strong desire to fulfil the gender role (ie, to raise their children by themselves) and put their children before their careers.

If had I tried, I could have balanced work and parenting. But I had a strong desire to raise my children by myself as much as possible; I chose part-time practice. (part time, 50 years, married)

For my patients, they had many other doctors to choose from. but for my children, I am their only mother. (full-time, 64 years, married)

#### *Gender-based discrimination*

Several respondents experienced gender-based discrimination that appeared to influence their subsequent decisions about work. Some respondents reported very negative comments from male colleagues who clearly indicated that women doctors were not wanted.

When I became a member of a clinical department at a university hospital, I was told, 'We do not need women. We won't teach women how to operate on patients.' I was very hurt and felt very sad. After it all, I gave up the struggle and chose another career path. I have no regrets, but sometimes I think that if I had been born 20 years later, I would have been a different type of physician. (full-time, 51 years, divorced)

When I was working at a university hospital, I saw that when a young female doctor expressed her opinion at a clinical conference, a senior male doctor said to her, 'Women and children must shut up.' (president of a company, 48 years, single)

#### *Switch from full-time to part time work and consequent career stagnation*

Our respondents provided examples from their career that indicated that after a certain point there was no further professional advancement.

I did not know why so many talented female doctors resigned from university hospitals when they became pregnant until I was in the same place. Because there are a very limited numbers of salaried positions at university hospitals, doctors who can afford to work on a long-term basis are better candidates than are women who have children. (part time, 39 years, married)

Female doctors do not take parental leave because of the limited number of co-workers. They have no choice but to quit a job or become part-timers. (full-time, 46 years, single)

Once female doctors shift from full-time to part time work, career development becomes very difficult because full-time practice is one of the requirements for specialist status.

Because of my part-time practice, I could not apply to be a specialist, which would require me to work full-time. (part time, 40 years, married)

After marriage, female doctors' work schedule and their place of residence both depend substantially on their husbands. Under such circumstances, women had no choice but to switch from full-time to part time work, which lead to fewer professional opportunities, resulting in career stagnation.

My four children and I moved to Hiroshima and then to Kobe [which are 700 and 500 km west of Tokyo, respectively] from Tokyo to follow my husband's transfer. (full-time, 50 years, married)

I went to the US with my husband because he studied abroad. I had a baby in the US and took care of the baby there (meaning that she was absent from professional work during the time period). (full-time, 47 years, married)

'Going out' was very difficult for me, so I could not attend seminars or annual meetings to meet the specialist requirements. Now, I am not entitled to hold a specialist position. I hope the medical societies of the clinical departments in Japan change their specialist requirements [so that they do not have to be based on full-time practice]. (full-time, 49 years, married, four children)

## DISCUSSION

The findings from this study demonstrated that two factors: poor working condition with poor child support, and stereotypical views on gender roles, contributed to a reduction of female doctors in the Japanese workplace and propelled women to switch from full-time to part time work. It was also found that poor working conditions influenced low aspirations of future career attainment and long working hours resulted in pregnant women being at risk of miscarriage or becoming psychologically depressed. We will discuss our results in the context of the extant literature.

A poor working condition represented by long working hours in this study is embedded in a chronic, nationwide medical workforce shortage that Japan has faced over the past three decades.<sup>2</sup> Although the data were not shown, our study found that the weekly working schedule among women in their 20's was 70 h. This is similar to the findings from a survey of 1036 doctors conducted by the Japanese Medical Labour Association:<sup>13</sup> physicians worked 10 h/day on average and approximately one-third worked more than 80 h/week, and one-fourth worked a night shift and then worked continuously the following day.<sup>13</sup> The present

study highlighted that some women specified that they had experienced near miscarriages or depression due to a heavy workload. There is an increasing body of evidence indicating that long working hours or frequent nights on call increase the risk of adverse pregnancy outcomes.<sup>14 15</sup> The current Japanese Labour Standard Act<sup>16</sup> allows a woman to take prenatal leave 6 weeks before childbirth, but only if requested for. In the clinical workplace, taking long-term leave immediately impacts on others, who then need to cover this additional work. This means there are no temporary or alternative staff to compensate for the deficit in the medical workforce. This may explain the lack of support and understanding from colleagues when women become pregnant and may be one of the main reasons women leave work completely rather than take maternity leave.<sup>4</sup>

Even after women have given birth, new barriers are presented to returning to work. Recent statistics have shown a significant shortage of childcare centres in Japanese society as a whole, with approximately 50 000 children on waiting lists to enter a nursery.<sup>17</sup> The lack of childcare is perpetuating the medical workforce shortage. The long working week combined with insufficient childcare during working hours seems to have negatively influenced the professional motivation to continue to work as a female doctor. Indeed we found that some women in our sample stated that it is very difficult to pursue a professional career while maintaining family responsibilities. In addition, in our previous study, based on a national survey of residents, we found that women were also less confident about their clinical competence than were their male peers.<sup>18</sup> The finding of less confidence among women is often reported in academic medicine.<sup>19</sup> The findings of our study may be explained by the role of women in medicine, where under such stressful circumstances (ie, a male dominated workplace, where male doctors are not supportive of female colleagues) women tend to be less confident.<sup>20</sup>

We also found that some women in the middle and older age groups were critical of younger women who appeared to them to have lower aspirations for future career development than they had. This may be explained by the generation gap between women who had worked before and after the Equal Employment Opportunity Law came into effect.<sup>21</sup> Before the introduction of the Act, it must have been even more challenging; consequently, older women with a pioneering spirit were less encouraging or supportive towards younger women who currently face work-life balance difficulties. In order to redefine gender roles and move away from older forms of gender stereotyping, male doctors, in particular, should be encouraged to share roles at work and at home. Participation in child rearing, household chores, and even parental leave, help men understand the major challenges faced by women at work. Increased understanding by male physicians may also lead to a needed gender balance of board members of Japanese medical

societies and to seeing the benefits of having a female perspective in a male dominated medical career.<sup>22</sup>

Our previous study showed that unmarried female doctors spent more time on household chores compared with married male doctors with children,<sup>23</sup> indicating that the gender-based division of household labour is prevalent in Japan. In this study, some women expressed their desire to raise their children on their own. The importance of choice must be respected but, at the same time, the women who choose to work need to be supported to do so, to reduce the medical staff shortage. The current poor working conditions for women with child caring responsibilities must be urgently improved. In addition, to support female careers, a system needs to be established that enables part time doctors to hold a specialist license. Currently, this is only issued to doctors working in full-time practice.

The medical schools should raise these issues with all medical students and discuss how they can combine medicine with future caring roles, as well as discussing how to be supportive of colleagues who have child caring roles.

Some respondents in this study had experienced gender-based discrimination. Such gender-related harassment seemed to influence perception of their value at work, resulting in some women deciding to leave rather than challenge the strong negative attitudes they encountered in the workplace. In this study, we found that women who perceived gender-based obstacles related to work opportunities or promotion were more likely to have moved to part time rather than full-time work. Once dropped into part time practice, the likelihood of having an opportunity to build a career easily deteriorates. This is one of the reasons why female physicians cannot pursue their career although they are legally offered maternity leave. The lower rate of full-time working practice among females compared with their male counterparts was considered as an obstacle to the utilisation of female doctors in the medical work force. This means that gender-based discrimination will probably remain a barrier<sup>15</sup> unless part time working is given equal status, as in other countries.<sup>24</sup>

### Limitations

This study has several limitations that need to be acknowledged. First, all of our respondents graduated from private medical schools. Thus, their views may not be generalisable to those educated in national, municipal and other private medical schools not included in the survey. Similarly, those who have felt uncomfortable with gender issues or with expressing their true concerns may not have participated in this study or may have declined to respond. Hence, the transferability of this study might be limited; however, the quotes cited in this study are very important in terms of whether they raise thought-provoking issues such as that healthcare systems should consider how to maximise women's potential to increase the numbers of women in leadership positions. Second, our analyses were based on

textual analyses using the KJ method, which may not have thematically saturated data. Third, our survey method did not permit probing for more information or for observation of non-verbal cues such as facial expressions or body language. Nevertheless, our sample was relatively large, and we therefore believe that we were able to identify the important themes.

The long working hours of doctors and the lack of childcare works against supporting Japanese female doctors returning to work following childbirth. The current system, which does not support part time training or working at the specialist level, also needs challenging. Unfortunately, our data have exposed negative attitudes towards female doctors from male colleagues; part of the problem is a system that does not provide sufficient cover for maternity leave in spite of maternity leave offered by law, resulting in other staff taking on heavy workloads and directing negative comments at pregnant females rather than at a system that is in need of modernisation. Finally, the roles of males and females in Japan need modernisation, reflecting the benefits of sharing work roles and parental roles, and supporting women to pursue careers they and society in general will benefit from.

### Author affiliations

<sup>1</sup>Department of Hygiene and Public Health, Teikyo University School of Medicine, Tokyo, Japan

<sup>2</sup>Department of Public Health, Juntendo University School of Medicine, Tokyo, Japan

<sup>3</sup>Department of Medical Education, University of Michigan Medical School, Ann Arbor, USA

<sup>4</sup>Department of Teikyo Support Center for Women Physicians and Researchers, Tokyo, Japan

<sup>5</sup>Department of the Centre for Medical Education Research, School of Medicine, Pharmacy and Health, Durham University, Durham, UK

**Acknowledgements** The authors would like to thank the alumni board members of the 13 medical schools for their collaboration in conducting the sequential surveys; the staff in the Department of Hygiene and Public Health, Teikyo University School of Medicine for their feedback and advice in developing the questionnaire; Dr Yuki Kozono, Dr Masako Akashi, Mr Akira Miyahira and Mr Haruhiko Shimizu for their contributions to data analyses; Miss Megumi Yukawa for her assistance in collecting data and Mr Yu Nomura for his assistance in developing the data set.

**Contributors** KN conceived the study design and carried out the survey. KN and YY performed qualitative analyses. KN drafted the manuscript, which was edited by LDG and JI. MT and SH contributed to project management and revision of the manuscript. All authors read and approved the final manuscript.

**Funding** KN has received research grants from the Ministry of Education, Science, Sports and Culture, Grant in Scientific Research (C), Number 21510290 and from the Pfizer Health Research Foundation.

**Competing interests** None.

**Ethics approval** The Institutional Review Board of Teikyo University School of Medicine (No. 08-107).

**Provenance and peer review** Not commissioned; externally peer reviewed.

**Data sharing statement** No additional data are available.

**Open Access** This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work

non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

## REFERENCES

- World Economic Forum. *The global gender gap report 2013*. [http://www3.weforum.org/docs/WEF\\_GenderGap\\_Report\\_2013.pdf](http://www3.weforum.org/docs/WEF_GenderGap_Report_2013.pdf)
- OECD Health Data. *Statistics and Indicators for 30 OECD countries* 2010. U.S. Medical School Applicants and Students. Association of American Medical Colleges. (1982–1983 to 2009–2010). <https://www.aamc.org/download/153708/data/charts1982to2012.pdf>
- Ministry of Health, Labour, and Welfare. *Surveys of Physicians, Dentists, and Pharmacists 2010*. <http://www.mhlw.go.jp/english/database/db-hss/spdp.html>
- Izumi M, Nomura K, Higaki Y, *et al*. Gender role stereotype and poor working condition pose obstacles for female doctors to stay in full-time employment: alumnae survey from two private medical schools in Japan. *Tohoku J Exp Med* 2013;229:233–7.
- Izumi M, Higaki Y. Life-time resignation rate was 73% among female doctors. *Med Educ (Japan)* 2008;39(Suppl):15–16.
- Ministry of Internal Affairs and Communications. *Statistics bureau director-general for policy planning & statistical research and training institute*. Labour Force Survey, 2011.
- The Cabinet Office, Government of Japan. A public opinion Survey. <http://survey.gov-online.go.jp/h24/h24-danjo/zh/z14.html>
- Yasukawa K, Nomura K. The perception and experience of gender-based discrimination related to professional advancement among Japanese physicians. *Tohoku J Exp Med* 2014; 232:35–42.
- Nomura K, Gohchi K. Impact of gender-based career obstacles on the working status of women physicians in Japan. *Soc Sci Med* 2012;75:1612–16.
- Charmaz K. *Constructing grounded theory: a practical guide through qualitative analysis*. London: Sage, 2006.
- Illing J. Theoretical perspectives in medical education research. In: Walsh K, ed. *The Oxford Textbook of Medical Education*. Oxford University Press, 2013:615–25.
- Kawakita J. *The way of thinking for creative development*. Tokyo: Chuukousinnyo, 1967.
- Japanese Medical Labour Association. *A survey of physician's work* (In Japanese). 2007.
- Bonzini M, Palmer KT, Coggon D, *et al*. Shift work and pregnancy outcomes: a systematic review with meta-analysis of currently available epidemiological studies. *BJOG* 2011;118:1429–37.
- Bonzini M, Coggon D, Palmer KT. Risk of prematurity, low birthweight and pre-eclampsia in relation to working hours and physical activities: a systematic review. *Occup Environ Med* 2007;64:228–43.
- Article 64-3 Limitations on Dangerous and Injurious Work for Expectant and Nursing Mothers, *Labour Standards Act*, Act No.49 of Apr 7, 1947.
- The number of children who are in the waiting lists for child-care facilities. Ministry of Health Labour and Welfare. <http://www.mhlw.go.jp/stf/houdou/2r98520000022mcp.html>
- Nomura K, Yano E, Fukui T. Gender differences in clinical confidence: a nationwide survey of resident physicians in Japan. *Acad Med* 2010;85:647–53.
- Blanch DC, Hall JA, Roter DL, *et al*. Medical student gender and issues of confidence. *Patient Educ Couns* 2008;72:374–81.
- Kilminster S, Downes J, Gough B, *et al*. Women in medicine—is there a problem? A literature review of the changing gender composition, structures and occupational cultures in medicine. *Med Educ* 2007;41:39–49.
- Act on Securing, Etc. of Equal Opportunity and Treatment between Men and Women in Employment, Act No. 113 of Jul 1, 1972.
- Tomizawa Y. Women in surgery: little change in gender equality in Japanese medical societies over the past 3 years. *Surg Today* 2013;43:1202–5.
- Yasukawa K, Nomura K. The division of labour by sex among Japanese physicians. *Med Educ (Japan)* 2012;43:315–19.
- Harrison RA, Gregg JL. A time for change: an exploration of attitudes toward part-time work in academia among women internists and their division chiefs. *Acad Med* 2009;84:80–6.