Association of off-the-job training with work performance and work–family conflict among physicians: a cross-sectional study in China

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ABSTRACT

Objectives To determine whether experiences of off-the-job training in domestic (DT) and overseas study (OS) settings are associated with work performance and work–family conflict in physicians.

Design, setting and participants We conducted a national cross-sectional survey in 77 public hospitals across seven provinces in China between July 2014 and April 2015. Participants were 3182 physicians.

Exposure Participants were categorised into four groups: none, DT only, OS only and DT and OS.

Primary outcome measures Work performance was assessed by work engagement, career attrition and patient-centred care. Work–family conflict was assessed by affecting care for family, feeling guilty towards family and receiving complaints from family.

Results A total of 25.89% participants had experienced DT only, 8.71% OS only and 8.47% DT and OS. After adjustment for potential confounders, participants who had experiences of DT and OS compared with those with no training were more likely to report positive work performance (pride in work: OR=2.11, 95% CI: 1.43 to 3.10; enjoyment of work: OR=1.67, 95% CI: 1.11 to 2.51; turnover intention: OR=0.54, 95% CI: 0.38 to 0.77; early retirement: OR=0.63, 95% CI: 0.45 to 0.89; and exhaustion: OR=0.66, 95% CI: 0.45 to 0.98) and less work–family conflicts (feeling guilty towards family: OR=0.51, 95% CI: 0.35 to 0.74; and complaints from family: OR=0.66, 95% CI: 0.47 to 0.91). We found no obvious association between DT/OS experience with patient-centred care.

Conclusions Physicians with DT and OS experiences are more likely to have better work performance and less work–family conflict than those without such experience. Physicians face increasing pressure to pursue continuing education and experience associated distress. Therefore, hospitals and government policymakers should promote DT and OS.

INTRODUCTION

Because of the rapid development of medical science over the last few decades, continuing workplace learning, especially job training, is increasingly important for physicians.1–4 In China, almost all hospitals have a science and education department to support medical staff in continuing medical education, including on-the-job training and off-the-job training. Many studies have focused on formal education for physicians (including residency training); therefore, little is known about the effect of job training on physicians’ work performance and family life.5–7 The difficulties of measuring job training and obtaining relevant data may explain the lack of studies in this area.8–10 A study of physicians working in general hospitals in China showed that 43% had received training in the last 3 years; of those who received training, approximately 64% received on-the-job training and 37% received off-the-job training. However, formal types of training (especially on-the-job training) may be considered boring by trainees.11 12 Although off-the-job training is generally considered beneficial for personal development, excessive learning tasks at work seem to be a source of stress and job burnout for clinicians.13 Additionally, the development of the field of global health has increased the need for international medical education, especially...
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in developing countries. In China, the government sponsored overseas study (mainly in form of visiting scholarships) in 111 countries or regions from 1996 to 2016, most such study took place in the USA (37.35%), followed by the United Kingdom (11.33%), Canada (6.88%) and Germany (6.79%). Off-the-job training includes domestic off-the-job training (DT) and off-the-job training abroad (overseas study, OS). Because off-the-job training has not been systematically recognised or routinely assessed in career development, little is known about the characteristics of DT and OS for physicians, or the effect of DT and OS on physicians’ work and personal life. Specifically, evaluation of the effect of off-the-job training has focused on the specialised skills and knowledge acquired, such as ultrasound-guided fine needle aspiration biopsy of the thyroid, and on overall satisfaction with the training content, there is a lack of research on work performance.

Although training enhance trainees’ knowledge and skills, the association of off-the-job training with work performance and work–family conflict among physicians has never been rigorously examined.

Given the importance and breadth of medical training and its association with distress in physicians worldwide, a better understanding of DT and OS and their effect on physicians’ work and personal life is now needed. The present study used data from a national survey of physicians in China to explore the association of DT and OS with work performance and work–family conflict among physicians. We hypothesised that physicians who had experiences of DT and OS would be more likely to show better work performance (as measured by self-reported work engagement, career attrition and patient-centred care) than those without such experience. We also hypothesised that physicians who had experiences of DT and OS would be likely to experience more work–family conflict than those without such experience.

METHODS

Study design and participants

The details of this survey have been described in a previous report. Briefly, between July 2014 and April 2015, we obtained data from a national cross-sectional survey of physicians from seven provinces across China. In the selected regions, there were 85 eligible public hospitals, 77 of which (90.59%) agreed to participate. For each hospital, convenience sampling was used to select four surgical departments (eg, departments of thoracic surgery, orthopaedics, hepatological surgery, joint surgery, urology and thyroid and neck surgery) and four internal medicine departments (eg, respiratory, gastroenterology, rheumatology, nephrology, endocrinology, cardiovascular, neurology and haematology). A total of 5754 physicians from 528 departments were asked to complete a survey. Participation was voluntary, and all data were kept confidential. A total of 4281 physicians responded to the survey. After excluding 634 invalid questionnaires and 465 questionnaires that had incomplete key data related to this study, the sample comprised 3182 (55.30%) physicians (figure 1). Survey participation was voluntary and informed consent was obtained from all participants before any data were collected. No reimbursements or incentives were given to participants.

Measurement

Participants were asked about their experience of off-the-job training using the question, ‘In the last 5 years, how many times did the hospital send you for domestic off-the-job training of more than 3 months?’ (response categories: 0, 1, 2, 3 and ≥4). Responses were dichotomised (no and yes) to represent DT experience in the last 5 years. Participants were also asked whether they had studied abroad (generally, this involved visiting scholarships). Responses were coded into two categories (no and yes). We categorised participants into four groups: no domestic off-the-job training or overseas study (none), DT only, OS only and DT and OS.

The primary outcome measures were work performance and work–family conflict, reflecting the effect of training on work and personal life, respectively. We assessed work performance according to three aspects of attitudinal and behavioural performance in the last year (Cronbach’s α=0.685): work engagement, career attrition and patient-centred care. We examined self-reported work engagement using two items: ‘Are you proud of your work?’ (pride in work) and ‘Do you enjoy your work?’ (enjoyment of work). We examined career attrition using three items: ‘Do you want to change your job?’ (turnover intention), ‘Do you want to retire early?’ (early retirement) and ‘Do you feel physically and mentally exhausted?’ (exhaustion). We assessed patient-centred care using three items: ‘Discussing issues with your patients’ (involvement), ‘Listening to your patients’ (accessibility) and ‘Washing hands after care’ (hand-washing after care). Work–family conflict was assessed using three questions (Cronbach’s α=0.637): ‘I am less able to care for my family because of work’ (affecting care for family), ‘I feel guilty about my family because of work–family conflict among physicians has never been rigorously examined.

Figure 1 Flowchart for recruitment of the participants.
of work (feeling guilty toward family)’ and ‘I receive complaints from my family because of work (complaints from family)’. Each question was answered using a five-point Likert scale with response options ranging from ‘very low’ to ‘very high’. All responses were recoded as binary variables: low (‘very low/low/average’) versus high (‘high/very high’). The binary variables were then used as outcome variables in the logistic regression models.

We identified the following covariates as potential confounders: sociodemographic characteristics (sex, age, marital status, educational level, economic status and title), hospital and departmental characteristics (hospital level, hospital type, academic status, physician specialty and the ratio of physicians to beds), internal hospital environmental characteristics (work pressure, pay justice and task justice) and social environmental characteristics (patient trust, unreasonable requests by patients and family support).

**Statistical analysis**

To adjust for non-responses, data were weighted by participants’ age and sex, according to demographic information issued by the National General Hospital in 2015. For crude comparisons, we used χ² tests for categorical variables (online supplemental eTables 1 and 2). Binary logistic regression analysis was conducted; figure 2 shows the association of participants DT and OS with work performance and work–family conflicts after adjusting for potential confounders. All logistic regression models were adjusted for physicians’ sociodemographic characteristics, hospital and departmental characteristics, internal hospital environmental characteristics and social environmental characteristics. ORs and 95% CIs were calculated for the unadjusted and adjusted regression models.

Several sensitivity analyses were conducted to test the robustness of the results: (1) adjustment for the effects of work–family conflict in all work performance models and adjustment for the effects of work engagement in all work–family conflicts models, (2) model excluding participants were physicians of traditional Chinese medicine and (3) model excluding participants from secondary hospital. All new models were adjusted for the previously described potentially confounding factors. All analyses were performed using IBM SPSS Statistics V.22. Statistical tests were two-tailed, and differences were considered significant at p <0.05.

**Patient and public involvement**

The study was conducted with physicians. Therefore, there was no patients or public involvement of any kind.

**RESULTS**

Table 1 shows the characteristics of participants by DT and OS experience. Of 3182 participants, more than half had no training experience (56.93%). Of those who had training experience, 25.89% had DT only, 8.71% had OS only and 8.47% had DT and OS. The sociodemographic characteristics of participants in the three training groups were significantly different from the group with no training experience: women, younger participants (age= ≤34 years) and participants with lower economic status and lower job status, were generally less likely to have received training. Participants with DT and OS experience were generally more highly educated, had higher professional ranks and had better economic status than those with no training experience (all p<0.001). Compared with the ‘none’ group, more participants in DT and OS group worked in tertiary hospitals and teaching hospitals (which are more established and recognised by the government) and reported greater pay justice, task justice and patient trust, and less family support (all p<0.001).

Positive work and life performance were more frequently reported by the DT and OS group (table 2). The overall work performance of participants was not high, but work–family conflict was high. For example, only 15.28% participants reported high work enjoyment, whereas 74.53% reported high job exhaustion and 77.71% reported high

![Figure 2](http://bmjopen.bmj.com/) The association of DT and OS with work performance and work–family conflicts. Adjusted models include covariates for sociodemographic characteristics (sex, age, marital status, education level, economic status, title); hospital and departmental characteristics (hospital level, hospital type, academic status, physician specialty, and the ratio of physicians to beds); internal hospital environmental factors (work pressure, pay justice, task justice) and social environmental factors (patient trust, unreasonable request by patients, family support). DT, domestic off-the-job training; OS, overseas study.
| Experience of DT and OS | None | DT only | P value | OS only | P value | DT and OS | P value |
|-------------------------|------|---------|---------|---------|---------|-----------|---------|
| Total                   | 56.93 | 25.89 | 8.71 | 8.47 |        |           |         |

**Sociodemographic characteristics**

| Sex | None | DT only | P value | OS only | P value | DT and OS | P value |
|-----|------|---------|---------|---------|---------|-----------|---------|
| Men | 56.60 | 54.03 | 59.22 | 0.013 | 61.73 | 0.016 | 60.59 | 0.043 |
| Women | 43.40 | 45.97 | 40.78 | 38.27 | 39.41 |        |         |

| Age (years) | None | DT only | P value | OS only | P value | DT and OS | P value |
|-------------|------|---------|---------|---------|---------|-----------|---------|
| ≤34 | 29.00 | 34.35 | 23.42 | <0.001 | 23.74 | <0.001 | 15.61 | <0.001 |
| 35–44 | 34.70 | 29.27 | 49.39 | 23.74 | 37.17 |        |         |
| ≥45 | 36.30 | 36.39 | 27.18 | 52.52 | 47.21 |        |         |

| Marital status | None | DT only | P value | OS only | P value | DT and OS | P value |
|----------------|------|---------|---------|---------|---------|-----------|---------|
| Single or other | 16.41 | 19.94 | 11.01 | <0.001 | 16.54 | 0.196 | 9.16 | <0.001 |
| Married | 83.59 | 80.06 | 88.99 | 83.46 | 90.84 |        |         |

| Education level | None | DT only | P value | OS only | P value | DT and OS | P value |
|-----------------|------|---------|---------|---------|---------|-----------|---------|
| Undergraduate and below | 52.98 | 54.38 | 57.36 | 0.083 | 47.10 | 0.005 | 36.43 | <0.001 |
| Masters | 35.66 | 36.02 | 35.60 | 37.32 | 31.40 |        |         |
| PhD | 11.36 | 9.60 | 7.04 | 15.58 | 32.17 |        |         |

| Economic status | None | DT only | P value | OS only | P value | DT and OS | P value |
|-----------------|------|---------|---------|---------|---------|-----------|---------|
| Poor | 32.98 | 36.36 | 30.05 | 0.005 | 29.60 | <0.001 | 23.05 | <0.001 |
| Fair | 58.61 | 57.54 | 62.41 | 56.32 | 56.51 |        |         |
| Good | 8.41 | 6.10 | 7.54 | 14.08 | 20.45 |        |         |

| Title | None | DT only | P value | OS only | P value | DT and OS | P value |
|-------|------|---------|---------|---------|---------|-----------|---------|
| Primary or other | 24.16 | 31.10 | 15.64 | <0.001 | 19.37 | <0.001 | 8.62 | <0.001 |
| Middle | 31.68 | 25.77 | 48.56 | 20.95 | 31.03 |        |         |
| High | 44.16 | 43.13 | 35.80 | 59.68 | 60.34 |        |         |

**Hospital and departmental characteristics**

| Hospital level | None | DT only | P value | OS only | P value | DT and OS | P value |
|----------------|------|---------|---------|---------|---------|-----------|---------|
| SH | 14.87 | 16.73 | 16.38 | 0.824 | 8.30 | <0.001 | 4.46 | <0.001 |
| TH | 85.13 | 83.27 | 83.62 | 91.70 | 95.54 |        |         |

| Hospital type | None | DT only | P value | OS only | P value | DT and OS | P value |
|---------------|------|---------|---------|---------|---------|-----------|---------|
| WM | 72.05 | 74.61 | 62.14 | <0.001 | 81.65 | 0.011 | 75.09 | 0.866 |
| TCM | 27.95 | 25.39 | 37.86 | 18.35 | 24.91 |        |         |

| Academic status | None | DT only | P value | OS only | P value | DT and OS | P value |
|-----------------|------|---------|---------|---------|---------|-----------|---------|
| Non-teaching | 80.22 | 80.34 | 85.44 | 0.002 | 72.30 | 0.002 | 71.75 | 0.001 |
| Teaching | 19.78 | 19.66 | 14.56 | 27.70 | 28.25 |        |         |

| Physician specialty | None | DT only | P value | OS only | P value | DT and OS | P value |
|---------------------|------|---------|---------|---------|---------|-----------|---------|
| Internal medicine | 52.74 | 52.81 | 53.03 | 0.917 | 52.71 | 0.973 | 51.30 | 0.643 |
| Surgery | 47.26 | 47.19 | 46.97 | 47.29 | 48.70 |        |         |

| The ratio of physicians to beds | None | DT only | P value | OS only | P value | DT and OS | P value |
|---------------------------------|------|---------|---------|---------|---------|-----------|---------|
| <0.20 | 27.87 | 26.99 | 30.93 | 0.092 | 30.15 | 0.192 | 22.47 | 0.131 |
| 0.20–0.30 | 40.13 | 39.64 | 38.76 | 41.91 | 45.69 |        |         |
| ≥0.30 | 32.00 | 33.37 | 30.31 | 27.94 | 31.84 |        |         |

**Hospital internal environmental characteristics**

| Work pressure | None | DT only | P value | OS only | P value | DT and OS | P value |
|---------------|------|---------|---------|---------|---------|-----------|---------|

Continued
levels of guilty about family. Specifically, compared with none group, the DT and OS group reported greater work engagement (pride in work: 13.97% vs 34.81% and enjoyment of work: 12.75% vs 31.48%), less career attrition (turnover intention: 68.38% vs 45.56%; early retirement: 62.86% vs 43.70% and exhaustion: 75.72% vs 62.59%) (all p<0.001).

DT and OS experience was strongly associated with work performance and work–family conflict after adjusting for potential confounders (figure 2). In the unadjusted analyses, participants who had DT and OS experience were three times as likely as those with no training experience to report greater work engagement (pride in work: OR=3.28, 95% CI: 2.47 to 4.36 and enjoyment of work: OR=3.13, 95% CI: 2.34 to 4.19) and lower career attrition (turnover intention: OR=0.39, 95% CI: 0.30 to 0.50; early retirement: OR=0.46, 95% CI: 0.35 to 0.59 and exhaustion: OR=0.54, 95% CI: 0.41 to 0.70). DT and OS experience was negative associated with work–family conflict (care for family: OR=0.60, 95% CI: 0.46 to 0.77; guilty towards family: OR=0.43, 95% CI: 0.33 to 0.57 and complaints from family: OR=0.59, 95% CI: 0.45 to 0.76). There was no significant association of DT and OS experience with patient-centred care.

After adjusting for all covariates, the ORs of the DT and OS group were slightly reduced but remained significant. Compared with those who had received no training, participants with DT and OS experiences were more likely to report better work performance (pride in work: OR=2.11, 95% CI: 1.43 to 3.10; enjoyment of work: OR=1.67, 95% CI: 1.11 to 2.51; turnover intention: OR=0.54, 95% CI: 0.38 to 0.77; early retirement: OR=0.63, 95% CI: 0.45 to 0.98) and less work–family conflicts (guilty towards family: OR=0.51, 95% CI: 0.35 to 0.74 and complaints from family: OR=0.66, 95% CI: 0.47 to 0.91). We found no obvious association of DT and OS experience with patient-centred care.

The results of all sensitivity analyses showed no significant changes in the size significance of the effects.

Table 1: Continued

| Experience of DT and OS | Total | None | DT only | OS only | DT and OS |
|-------------------------|-------|------|---------|---------|-----------|
|                         | %     | %    | %       | %       | %         |
| V. low, somewhat low or | 20.31 | 19.49| 20.80   | 0.435   | 18.41     |
| neutral                 |       |      |         | P value | 0.672     | 26.02     |
| Somewhat high or very   | 79.69 | 80.51| 79.20   | 81.59   | 73.98     |
| high                    |       |      |         | P value |           |           |
| Pay justice             |       |      |         |         |           |           |
| V. low, somewhat low or | 92.06 | 93.81| 92.60   | 0.243   | 91.27     |
| neutral                 |       |      |         | P value | 0.112     | 79.26     |
| Somewhat high or very   | 7.94  | 6.19 | 7.40    | 8.73    | 20.74     |
| high                    |       |      |         | P value |           |           |
| Task justice            |       |      |         |         |           |           |
| V. low, somewhat low or | 86.50 | 88.72| 85.80   | 0.034   | 86.96     |
| neutral                 |       |      |         | P value | 0.393     | 73.33     |
| Somewhat high or very   | 13.50 | 11.28| 14.20   | 13.04   | 26.67     |
| high                    |       |      |         | P value |           |           |
| Social environmental characteristics |       |      |         |         |           |           |
| Patient trust           |       |      |         |         |           |           |
| V. low, somewhat low or | 88.64 | 91.51| 88.11   | 0.006   | 82.97     |
| neutral                 |       |      |         | P value | <0.001    | 76.87     |
| Somewhat high or very   | 11.36 | 8.49 | 11.89   | 17.03   | 23.13     |
| high                    |       |      |         | P value |           |           |
| Unreasonable requests by patients |       |      |         |         |           |           |
| V. low, somewhat low or | 65.95 | 65.80| 66.87   | 0.591   | 65.45     |
| neutral                 |       |      |         | P value | 0.910     | 64.68     |
| Somewhat high or very   | 34.05 | 34.20| 33.13   | 34.55   | 35.32     |
| high                    |       |      |         | P value |           |           |
| Family support          |       |      |         |         |           |           |
| V. low, somewhat low or | 21.04 | 20.73| 18.71   | 0.231   | 21.30     |
| neutral                 |       |      |         | P value | 0.828     | 29.74     |
| Somewhat high or very   | 78.96 | 79.27| 81.29   | 78.70   | 70.26     |
| high                    |       |      |         | P value |           |           |

DT, domestic off-the-job training; OS, overseas study; SH, secondary hospital; TCM, traditional Chinese medicine; TH, tertiary hospital; WM, western medicine.
Table 2  Work performance and work–family conflicts by experience of DT and OS

| Experience of DT and OS | None | DT only | P value | OS only | P value | DT and OS | P value |
|-------------------------|------|---------|---------|---------|---------|-----------|---------|
| Total % | 56.93 | 25.89 | 8.71 | 8.47 |  |

**Work performance**

**Work engagement**

| | Pride in work | | | Enjoyment of work | | | |
|---|---|---|---|---|---|---|---|
| | Very low or somewhat low | 41.18 | 46.22 | 38.71 | <0.001 | 36.69 | 0.006 | 19.63 | <0.001 |
| | Neutral | 41.45 | 39.81 | 42.72 | 44.24 | 45.56 |  |
| | Somewhat high or very high | 17.37 | 13.97 | 18.57 | 19.06 | 34.81 |  |

**Career attrition**

| | Turnover intention | | | Early retirement | | | |
|---|---|---|---|---|---|---|---|
| | Very low or somewhat low | 11.89 | 10.26 | 11.18 | 0.330 | 11.19 | 0.258 | 25.93 | <0.001 |
| | Neutral | 21.68 | 21.36 | 18.96 | 25.27 | 28.52 |  |
| | Somewhat high or very high | 66.43 | 68.38 | 69.87 | 63.54 | 45.56 |  |

**Exhaustion**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Very low or somewhat low | 5.06 | 4.30 | 5.22 | 0.528 | 5.05 | 0.842 | 9.63 | <0.001 |
| | Neutral | 20.41 | 19.98 | 19.08 | 20.22 | 28.06 | 31.85 |  |
| | Somewhat high or very high | 74.53 | 75.72 | 75.70 | 74.73 | 43.70 |  |

**Patient-centred care**

| | Involvement | | | Accessibility | | | |
|---|---|---|---|---|---|---|---|
| | Very rarely or rarely | 3.35 | 2.87 | 4.25 | 0.184 | 1.80 | 0.486 | 5.58 | 0.004 |
| | Occasionally | 14.79 | 14.24 | 14.20 | 15.83 | 19.33 |  |
| | Frequently or very frequently | 81.86 | 82.89 | 81.55 | 82.37 | 75.09 |  |

**Hand washing after care**

| | Very rarely or rarely | 10.56 | 10.65 | 11.18 | 0.026 | 9.75 | 0.283 | 8.89 | 0.043 |
| | Occasionally | 23.49 | 24.45 | 19.68 | 20.58 | 31.48 |  |
| | Frequently or very frequently | 65.96 | 64.90 | 69.14 | 69.68 | 59.63 |  |

**Work–family conflicts**

| | Affecting care for family | | | Feeling guilty towards family | | | |
|---|---|---|---|---|---|---|---|
| | Very low or somewhat low | 25.24 | 23.68 | 26.33 | 0.144 | 26.71 | 0.405 | 30.86 | <0.001 |
| | Neutral | 15.29 | 14.40 | 15.78 | 15.52 | 19.70 |  |
| | Somewhat high or very high | 59.47 | 61.92 | 57.89 | 57.76 | 49.44 |  |
and patient-centred care to provide a more detailed measure of physician work performance.\textsuperscript{31} DT and OS experience was found to improve work engagement and reduce career attrition, which is consistent with previous study findings. To some extent, off-the-job training is similar to the use of (domestic and international) study tour, which is a traditional approach to education used in various countries and approach groups worldwide.\textsuperscript{32, 33} It is worth pointing out that we found no significant association of DT and OS with patient-centred care. This suggests that DT and OS have no clear effect on enhancing physicians’ ability to care for patients and thus improving physician–patient relationships.\textsuperscript{26, 34} This may be a problem worthy of attention in the development of future training programmes.

Regarding work–family conflict, previous studies have shown that medical trainees face many personal challenges when participating in off-the-job training, such as how to balance clinical training and family responsibilities. However, our findings indicate that DT and OS can reduce work–family conflict. This may be because DT and OS provide travel opportunities that enable the family for holidays, or provide educational opportunities for physicians’ spouse and children.

The finding that the combination of DT and OS leads to better work performance and less work–family conflict suggests the presence of a synergistic effect.\textsuperscript{35} There is evidence of an increasing interest in and sense of importance of global health training during residency; trained physicians with global health knowledge will be essential in both developing and developed countries, as civilian mobilisation and globalisation of diseases.\textsuperscript{3, 15}

Training may be seen as expensive by hospitals and medical authorities who may spend resources on projects other than staff trainings. In fact, very few physicians display good performance and effectiveness in high-intensity work environments. One survey found that physicians at all levels were dissatisfied with their day-to-day work; some general practitioners who had worked full time with no training breaks had experienced

### DISCUSSION

To the best of our knowledge, this is the first study to use a nationally representative sample to explore the association of DT and OS with work performance and work–family conflict in physicians in China. Overall, approximately one-third physicians had DT experience in general hospitals in China and one-sixth had OS experience. More interestingly, compared with physicians with no off-the-job training experience, those with DT or/and OS showed better work performance and less experienced work–family conflict (online supplemental eFigures 3 and 4, respectively).

In response to the rapid development of medical science and the need for hospitals to maintain work efficiency to save human resources, the main type of continuing medical education is currently in-service training, which includes online learning.\textsuperscript{29, 50} In-service training and online training may save time and money because they are less likely to negatively affect physicians’ workload than onsite DT or OS. Therefore, it is important to determine the extent to which off-the-job training can improve physicians’ work performance.

We found that compared with physicians with no off-the-job training, those with off-the-job training experience had better work performance and less work–family conflict. Most previous studies have used a satisfaction index to assess the effect of training; in contrast, the present study assessed work engagement, career attrition

### Table 2

| Experience of DT and OS | Total | None | DT only | OS only | DT and OS |
|------------------------|-------|------|---------|---------|-----------|
|                        | %     | % (ref.) | % | P value | % | P value | % | P value |
| Very low or somewhat low | 6.00  | 4.91 | 5.83 | 0.505 | 7.22 | 0.147 | 12.64 | <0.001 |
| Neutral                 | 16.30 | 15.12 | 15.92 | 17.33 | 24.16 |
| Somewhat high or very high | 77.71 | 79.97 | 78.25 | 75.45 | 63.20 |

DT, domestic off-the-job training; OS, overseas study.

Specifically, further adjustment for the effects of work–family conflict in all work performance models and adjustment for the effects of work engagement in all work–family conflict models produced results very similar to the original results (online supplemental eFigures 1 and 2, respectively). When we separately excluded participants were physicians of traditional Chinese medicine and those who worked in secondary hospitals, the results were the same, that is, participants with experience of DT and OS had better work performance and less experienced work–family conflict (online supplemental eFigures 3 and 4, respectively).

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|------------------------|-------|------|---------|---------|-----------|
|                        | %     | % (ref.) | % | P value | % | P value | % | P value |
| Very low or somewhat low | 6.00  | 4.91 | 5.83 | 0.505 | 7.22 | 0.147 | 12.64 | <0.001 |
| Neutral                 | 16.30 | 15.12 | 15.92 | 17.33 | 24.16 |
| Somewhat high or very high | 77.71 | 79.97 | 78.25 | 75.45 | 63.20 |

DT, domestic off-the-job training; OS, overseas study.

Specifically, further adjustment for the effects of work–family conflict in all work performance models and adjustment for the effects of work engagement in all work–family conflict models produced results very similar to the original results (online supplemental eFigures 1 and 2, respectively). When we separately excluded participants were physicians of traditional Chinese medicine and those who worked in secondary hospitals, the results were the same, that is, participants with experience of DT and OS had better work performance and less experienced work–family conflict (online supplemental eFigures 3 and 4, respectively).
burnout, or had left the profession earlier than planned because they felt they could not guarantee safe standards of care for their patients.31 This suggests that an over-emphasis on efficiency is not helpful. On the contrary, physicians in a continuous high-intensity working environment experience high levels of distress. DT or OS may not only provide new skills and knowledge and improve work performance but also relieve the stress of medical professionals. This is beneficial to individual physicians, their families and their workplaces.

This study had several limitations. First, the response rate was relatively low. Low response rates are common in clinician surveys worldwide,36 37 particularly in China. To address this limitation, we used a sample of physicians that corresponded to the national demographic statistics in the same period as the survey to weight the sample and improve its representativeness. Second, we did not compare off-the-job training with on-the-job training (including online training). Because continuing medical education is compulsory for all clinicians in China, almost all participants had received on-the-job training. Because of differences in training content, it is difficult to compare the effects of on-the-job and off-the-job training. Third, we had no information about the duration of DT and OS because the survey questions did not address this aspect of training. Future studies could expand on our preliminary findings by conducting a more in-depth analysis of the dose–response relationship. Finally, because of the cross-sectional study design, we were unable to determine the cause-and-effect relationships between DT/OS experience and work performance and work–family conflict.

CONCLUSION
Our findings provide evidence that physicians with experience of DT and OS are more likely to show better work performance and less work–family conflict than those without such experience. As physicians face increasing pressure to engage in continuing education, and experience associated distress, our findings suggest that provision of DT and OS (similar to study tours) may be an effective approach that has many benefits. This approach should be promoted by hospitals and government policy-makers.

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