Chinese medical staffs in private hospitals are more productive than those in public hospitals, really?

Dr. rer. biol. hum. Tianan Yang

September 15th, 2016
Agenda

- About me
- Background of my topic
- Method
- Results
- Discussion
- Summary
About me

The university I graduated:

- Tongji Medical College, Huazhong University of Science and Technology [Bachelor, QS 440]
- Peking Union Medical College, Tsinghua University [Master, QS 24]
- IBE, Ludwig-Maximilians-Universität München [Ph.D., QS 68]
Beijing Institute of Technology (BIT) is a public university with a traditional focus on science and technology but developing into other areas such as management and humanities. The Institute emphasises ethics in scholarship, discovery of truth, and contribution to mankind through profound academic accomplishments. BIT was founded in 1940 in Yan’an, Shaanxi Province and was relocated to Beijing in 1949. The following year, the main campus and the Departments of Maths, Physics and Chemistry of the Institut Franco-Chinois were merged with BIT. BIT has always formulated its strategies in light of national strategic needs and global developments in

- #389 QS World University Rankings
- 101-150 QS WU Rankings by Subject Engineering - Chemical
- 161 QS WU Rankings by Faculty Engineering and Techno...
- #28 BRICS Rankings
- #70 Asian University Rankings
About me

Assistant Prof. Dr. Tianan Yang

School of management and economics, Beijing Institute of technology

Study fields:

- Health policies on mental health
- Human resource management in health sector
- Health management (stress management)

Welcome to contact me for further collaboration!

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1. Background of my topic
Why to focus on HRM in health sector of China?
1. Background

The WHO Health Systems Framework

System building blocks

- Leadership / governance
- Health care financing
- Health workforce
- Medical products, technologies
- Information and research
- Service delivery

Goals/outcomes

- Improved health (level and equity)
- Responsiveness
- Financial risk protection
- Improved efficiency

Access
Coverage

Quality
Safety
1. Background

- Human resources management in health sector of China
  - regulations that the medical staffs (residents, Licensed Physicians, Licensed Pharmacist, experts of health management) should follow
  - Seldom regulations concerning about the negative impact of psychosocial factors, such as job stress, on the productivity and health service quality of hospitals and health sector
Psychosocial factors: Job stress?
1. Background

- Job stress exceedingly impairs the **productivity of medical staffs** and hospitals through causing **poor health** and extremely high **presenteeism**.
## Summary of Stress-Related Factors at Work (From the WHO)

<table>
<thead>
<tr>
<th>Work Content</th>
<th>Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Job content</strong></td>
<td>Monotony, (under-)stimulation, meaning of task, variety of work</td>
</tr>
<tr>
<td><strong>Workload &amp; schedule</strong></td>
<td>Work overload or underload; number of work hours; levels of time pressure; strict or flexible, long or short, social or unsocial, predictable or unpredictable schedule</td>
</tr>
<tr>
<td><strong>Participation &amp; control</strong></td>
<td>Participation in decision-making, control of work process, pace, working hours or environment</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Context</th>
<th>Factors</th>
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</thead>
<tbody>
<tr>
<td><strong>Career development</strong></td>
<td>Career stagnation and uncertainty, under- / over-promotion, poor pay, job insecurity, unclear or uncertain performance-evaluation system</td>
</tr>
<tr>
<td><strong>Role in organization</strong></td>
<td>Role ambiguity and role conflicts, individual responsibility</td>
</tr>
<tr>
<td><strong>Interpersonal relationships at work</strong></td>
<td>(In-)considerate or (un-)supportive supervision, social or physical isolation, poor relationships with superiors, bullying/harassment</td>
</tr>
<tr>
<td><strong>Organizational culture</strong></td>
<td>Communication, leadership, support for problem-solving and personal development, clarity about organization objectives</td>
</tr>
<tr>
<td><strong>Work-life balance</strong></td>
<td>Conflicting demands of work and home, support to work at home, organizational rules and policies to support work-life balance</td>
</tr>
</tbody>
</table>
1. Background: typical stress

- One of the main causes of several severe diseases
- Extremely high economic and social impact
  - Leading to mental health problems and other stress-related disorders
  - Leading causes of early retirement from work, high absence rates, overall health impairment, and low organizational productivity
1. Background: job stress

May 23, 2014

Dr. Tianan Yang
Chair for Public Health and Health Services Research,
Ludwig-Maximilians-University

Re: ACOH 2014 Young Investigator’s Award

Dear Dr. Tianan Yang,

Greetings to you from Japan, and from the Secretariat of the 21st Asian Conference on Occupational Health (ACOH).

We are most delighted to confirm that you are one of the successful recipients of the ACOH 2014 Young Investigator’s Award. Congratulations!

This means that you will be refunded your payment of the registration fee, at the conference registration desk when you arrive in Fukuoka. All recipients of this award are expected to have initially paid the registration fee during online registration, but will be refunded the same amount once confirmed as a successful recipient of the grant.

Kindly print this letter and present it at the registration desk with your passport (to confirm your identity), in exchange for the monetary refund.

Congratulations again and see you in September.

Sincerely,
Akira Ogami
Secretary-General
ACOH 2014 Secretariat
c/o Institute of Industrial Ecological Sciences
University of Occupational Environmental Health, Japan
1-1 Iseigaoka, Yahatanishiku, Kitakyushu, Fukuoka
807-8555, Japan E-mail: acoh2014@mbox.med.uoeh-u.ac.jp
1. Background: job stress


Figure 2. Final model of how co-worker and supervisor support affect job stress and presenteeism. (Numbers not in bold are the standardized regression coefficients and numbers in bold are explained variability, $\chi^2$/degrees of freedom = 4.840, root mean square error of approximation = 0.048, goodness normed fit index = 0.963, comparative fit index = 0.973, Tucker–Lewis index = 0.966, expected cross-validation index = 0.375; *** $p < 0.001$).
Presenteeism?
1. Background: presenteeism

**PRESENTEEISM** *(most comprehensive)* Reduced productivity at work due to **health problems or other events** that distract one from full productivity (Hummer, et al., 2002; Whitehouse, 2005)

Why to focus on this population?
1. Background: healthcare disturbance


1. Background: a particular population

- **Healthcare disturbance** causing frequent deaths is one of typical job stress in health sector of China, rarely reported in large global economies.

- Some Chinese particular issues:
  - Imbalance payment & Huge amount of workload
  - Failure is not acceptable to the family of patients
  - All dissatisfaction vent on medical staffs
  - Lacking of basic respect from patients

- Chinese medical staffs: especially in Tertiary hospitals, extremely high job stress from their patients, colleagues, family & the whole society.

- Therefore, Chinese medical staffs is a particular population that calls for our attentions.
Why to conduct this study?
Comparing Country’s GDP to China’s Provinces

Chinese administrative divisions by nominal GDP per capita in USD ($) (2014)

- 15+
- 10-15
- 7.5-10
- 6-7.5
- 5-6
- 4-5
This is a graph, made using data taken from Wikipedia, which shows the GDP sizes of the biggest provincial/state economies around the world, in nominal terms.
GDP share in eastern, middle and western of China (not including Hong Kong, Macau and Taiwan)

Great gaps!!!
Great gaps!!!

**Hospital Outpatient Volume, China, 2008 & 2013**

- 2008: 1.3 million
- 2013: 2.9 million
- 15% CAGR

**Hospital Inpatient Volume, China, 2008 & 2013**

- 2008: 5.2 million
- 2013: 17.5 million
- 20% CAGR

Source: MOH Website and China Statistical Yearbook
1. Background: research questions

- Job stress is extremely high in China, especially in tertiary level hospitals of China
  - These hospitals are in public sector
  - Counterproductive Work Behavior?

- Empirical evidence about Chinese medical staffs in private hospitals is still lacking.
  - The differences between public and private sector
  - Any Chinese characteristics to share?

Thus, we aim to investigate
- whether the medical staffs in private sector suffer so much stress & presenteeism as their colleagues in the public hospitals of China
- whether job stress still causes presenteeism through health

Great gaps!!!
2. Method
2. Method

Sample

- A cross-sectional study in China
- Representative samples aged 20 to 65 years
- Eastern, middle and western part of China
- **HMJ hospital (n=222)**, the representative private hospital in China, & from representative tertiary public hospitals in China (**n=2024**)
- Eleven cities in China (random selected from eastern, central and western part of China, respectively)
- Final sample, **n=2246**
2. Method

**Instruments**
- “Challenge and Hindrance-Related Self-Reported Stress Scale” (CHSS)
- “Short form-8 Health Survey” (SF-8)
- “Work limitation questionnaire” (WLQ)
- **Participant Lifestyle Questionnaire (PLQ):**
  - perceived ability to work

**Control Variables**
- Age
- Gender
- Level of education
- Working years in hospitals
- Title of medical staffs
- Department of medical staffs
2. Method

Statistical analysis

- SPSS 21.0 and AMOS 21.0.0
- Missing values for each included indicator
- Imputation: The expectation-maximization (EM) implementation of maximum likelihood (ML)
- *Linear Mixed-Effect Model*
- *Structural equation modelling*
2. Method

- Pearson correlation analysis (p values $\geq 0.05$ and correlation coefficients $\geq 0.85$)

- **Local Fit**: factor reliability $\geq 0.6$; indicator reliability $\geq 0.3$; P < 0.05 for all factor loadings; value of average proportions of indicator variance extracted $\geq 0.5$; chi-square minimal degrees of freedom (CMIN/DF<5), appropriate Large Standardized Residuals Covariance (<4),

- **Global Fit**: root mean square error of approximation (RMSEA) $\leq 0.05$; the Goodness of Fit Index (GFI), Normed Fit Index (NFI), Comparative Fit Index (CFI) and Tucker-Lewis index (TLI) $\geq 0.90$; the smallest expected Cross-Validation Index (ECVI)

- The statistical significance of **mediated effects**: Sobel Test
3. Results
3. Results: who are more productive?

Linear mixed-effects model fit by REML
Data: dat.complete
AIC  BIC logLik
12905.49 13113.47 -6415.744

Random effects:
Formula: ~1 | DIQU1
(Intercept) Residual
StdDev: 2.553805 5.350493

Fixed effects: P1 ~ type + P7Q1 + P7Q2 + P7Q3 + P7Q4 + P7Q5 + P7Q6 + P7Q7
Value Std.Error  DF   t-value p-value
(Intercept) 28.611103 1.8021456 2031 15.876133 0.0000
  type  -3.706248 0.4667008 2031 -7.941378 0.0000
P7Q12     0.648217 0.4630716 2031  1.399821 0.1617

Linear mixed-effects model fit by REML
Data: dat.complete
AIC  BIC logLik
6530.078 6738.062  -3228.039

Random effects:
Formula: ~1 | DIQU1
(Intercept) Residual
StdDev: 0.2431557 1.12597

Fixed effects: P4Q12 ~ type + P7Q1 + P7Q2 + P7Q3 + P7Q4 + P7Q5 + P7Q6 + P7Q7
Value Std.Error  DF   t-value p-value
(Intercept) 2.9054580 0.3498894 2031 8.303932 0.0000
  type  -0.9226133 0.0977758 2031 -9.436012 0.0000
P7Q12     0.0810641 0.0973991 2031  0.832288 0.4053
P7Q13     0.1593348 0.1249587 2031  1.284350 0.2002
### 3. Results: challenge VS hindrance

#### Challenge stress

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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>0.1112</th>
<th>0.0013</th>
<th>2.4e-06</th>
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<tbody>
<tr>
<td></td>
<td>0.0453</td>
<td>-</td>
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<td>6.1e-05</td>
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Kruskal-Wallis rank sum test

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<tbody>
<tr>
<td>data: var.x by var.y</td>
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<tr>
<td>Kruskal-Wallis chi-squared = 38.445, df = 3,</td>
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* p-value = 2.276e-08

#### Hindrance stress

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* p-value = 2.276e-08

P value adjustment method: none
3. Results: Who suffer more health disturbance?

Linear mixed-effects model fit by REML
Data: dat.complete

AIC      BIC      logLik
6530.078 6738.062  -3228.039

Random effects:
   Formula: ~1 | DIQU1
             (Intercept) Residual
StdDev:  0.2431557  1.12597

Fixed effects: P4Q12 ~ type + P7Q1 + P7Q2 + P7Q3 + P7Q4 + P7Q5 + P7Q6 + P7Q7

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<th>DF</th>
<th>t-value</th>
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<tbody>
<tr>
<td>(Intercept)</td>
<td>2.905</td>
<td>0.349</td>
<td>2031</td>
<td>8.303</td>
<td>0.0000</td>
</tr>
<tr>
<td>type</td>
<td>-0.923</td>
<td>0.098</td>
<td>2031</td>
<td>-9.446</td>
<td>0.0000</td>
</tr>
<tr>
<td>P7Q12</td>
<td>0.081</td>
<td>0.097</td>
<td>2031</td>
<td>0.832</td>
<td>0.4053</td>
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3. Results: Who are more healthier?

Linear mixed-effects model fit by REML
Data: dat.complete
   AIC     BIC   logLik
6530.078 6738.062  -3228.039

Random effects:
  Formula: ~1 | DIQU1
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3. Results: summary

1. Challenge stress:
   - Extremely **high** in the **central** region of China
   - Significantly **lower** in **private** hospital than in the public hospitals of western and central region of China
   - Medical staffs suffer less **challenge stress in eastern** region hospitals than in private hospitals, but not significant

2. Hindrance stress:
   - Extremely **high** in the **central & western** region of China
   - Significantly **lower** in **private** hospital than in the public hospitals of central and western region of China
   - Medical staffs is less **hindrance stress in private** hospitals than in public hospitals of eastern region of China, but not significant
3. Health of medical staffs:
- Significantly *healthier* in private hospital than in the public hospitals of central and western region of China
- No significant difference between private hospitals and the public hospitals of eastern region of China

4. Healthcare disturbance (violence against medical staffs):
- Extremely *high* in the eastern & western region of China
- Significantly *lower* in private hospital than in the public hospitals
3. Results: summary

5. Presenteeism (HPQ):
   - Significantly lower in private hospital than in the public hospitals of eastern, central and western region of China
   - No significant difference between in the public hospitals of central and western region of China

6. Presenteeism (WLQ):
   - Significantly lower in private hospital than in the public hospitals of central and western region of China
   - No significant difference between private and part public (central & western) hospitals

7. Conclusions
   - High productivity in the Private hospitals
   - Among public hospitals, high productivity in the hospitals of eastern region of China
3. Results: SEM

Final model of challenge & hindrance stress affect health & presenteeism.

(Numbers not in bold are the standardized regression coefficients and numbers in bold are explained variability, $X^2$/degrees of freedom = 5.676, root mean square error of approximation = 0.046, goodness normed fit index = 0.956, comparative fit index = 0.975, Tucker–Lewis index = 0.970; *** p < 0.001).
4. Discussion
4. Discussion

- Private hospital has conducted effective policies to intervene job stress, healthcare disturbance and presenteeism, and thus, lower job stress, healthier & productive in organizational level.
- Public hospitals from central and western region of China indicates low productivity due to higher hindrance stress, more health disturbance & poor health.
- Public hospitals should learn the way of management in private hospitals to enhance productivity and quality of health service.
4. Discussion

- Instruments to measure presenteeism in China calls for further revision (WLQ VS HPQ)

- The validation and revision of instruments to measure psychosocial factors in China is in a great hurry

- The system of management in private hospitals has taken psychosocial factors into account, which enhanced the productivity in organizational level by concerning the respect for and understanding of medical staffs. This is helpful suggestion to the deans of tertiary level of public hospitals in China
4. Discussion: tips for stress interventions

Stressful working environment → Psychological Symptoms (depression et al.) → Physical Symptoms (burnout et al.) → Diseases (hypertension, diabates et al.) → Consequences (Absenteeism, Presenteeism, Turnover)

- Training or Learning Interventions
- Social-Support Interventions
- Organizational Interventions
- Occupation Interventions
- Physiological & Psychological Interventions

5. Summary: Take-Home Messages 1

- Presenteeism is an important indicator of potential productivity loss.
- Public hospitals from central and western region of China indicates low productivity due to higher hindrance stress, more health disturbance & poor health.
- Medical staffs in private sector are less stressful as their colleagues in the public hospitals of China.
- Concerning about psychosocial factors in hospitals of China could effectively reduce the job stress impacting on health and productivity, and enhance quality of health service & productivity in organizational level.
5. Summary: Take-Home Messages 2

- **Respect** for medical staffs in public hospitals
- To reduce their **workload** in public hospitals
- Appropriate **working patterns** in public hospitals
- To clearly **identify** the range of the responsibility that medical staff should take in public hospitals
- **Equality in promotion, payment and performance evaluation** in public hospitals
5. Summary: Take-Home Messages 3

- Practical guidelines (from the aspects of hospitals):
  - To enhance **working environment/climate** in public hospitals
  - To improve **social support** (coworker & supervisor)
  - To enhance the **job security** of medical staffs in public hospitals
  - To provide plans of **career development** & clearly **job description** for medical staffs in public hospitals (from the aspect of human resource management)
Thank you very much for your attention!
About me

Assistant Prof. Dr. Tianan Yang

School of management and economics, Beijing Institute of technology

Study fields:

- Health policies on mental health
- Human resource management in health sector
- Health management (stress management)

Welcome to contact me for further collaboration!

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