Research paper

Psychological strains, depressive symptoms, and suicidal ideation among medical and non-medical staff in urban china

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ABSTRACT

Background: The Strain Theory of Suicide has been tested and well supported regarding rural people who show risk of suicide. Studies on the impact of psychological strains on psychopathologies and suicidality in urban environments in China have been lacking.
Aims: This study was designed to further examine the associations between psychological strains, depressive symptoms, and suicidal ideation in two separate urban samples of adults in China.
Methods: One sample consisted of randomly selected medical employees of a large hospital ($n = 1012$), and a second sample included heterogeneous office employees ($n = 1052$). A self-administered questionnaire was used to collect demographics, psychological strains, social support, depressive symptoms, and suicidal ideation.
Results: Depressive symptoms were associated with longer work hours, less social support, value strain, aspiration strain and coping strain among medical staff, and were linked to longer work hours, less social support, aspiration strain and coping strain among non-medical staff. Suicide ideation was associated with longer work hours, coping strain, and depression among medical staff, and was linked to longer work hours, gender, religion, value strain and depression among non-medical staff.
Conclusions: Both depressive symptoms and suicidal ideation were associated with psychological strains among Chinese urban professionals. Reduction of psychological strain is necessary to help maintain proper mental health and to ensure optimal performance at work.

1. Introduction

According to the Strain Theory of Suicide, strain is hypothesized to precede psychopathologies and suicide behaviors. It emphasizes that psychological issues arise from two or more conflicting or competing stressors or social experiences (Zhang, 2005). Strains are more serious, frustrating and threatening to an individual than cognitive dissonance and the extreme consequences can include mental disorders such as depression, anxiety, substance use and even suicide. Such strains may be moderated by social factors such as social integration, and psychological factors such as personality traits, but can also be strengthened or exaggerated by psychopathologies such as depression in the path from strains to mental disorder or suicide. The theory posits that there are at least four kinds of strain: (1) Value Strain occurs when an individual has two or more internalized beliefs at the core of their value system, that are in conflict or competition with one another at a given point in time.

(2) Aspiration Strain develops when there is a discrepancy between an individual's aspirations or life goals and the reality of their inability to meet such lofty goals. (3) Relative Deprivation Strain stems from the perception that others with a similar background or within a comparable social group have attained comparatively greater resources or lead a better life. (4) Coping Strain occurs when an individual does not deal effectively with challenges and crises in life.

Previous research has found that greater levels of strain overall can lead to serious psychological and behavioral consequences. For example, a link between psychological strains and suicide has been identified among previous suicide attempters (Sun and Zhang, 2016), in rural Chinese suicides (Zhang et al., 2009), and among college students (Zhang and Zhao, 2017). Examination of suicide notes (Zhang and Lester, 2008) and biographies of celebrity suicides (Zhang et al., 2013) in Western countries further supports the importance of strain theory on suicide behavior. Various types of strain have been associated with

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psychopathology and suicide behavior across various samples and situations. For example, aspiration strain and coping strain have been positively associated with depression among college students (Zhang et al., 2016), whereas value strain (Zhang and Lv, 2014; Zhang and Zhao, 2013) and relative deprivation (Zhang and Lv, 2014) have been positively linked with depression in rural populations. Value strain (Zhang et al., 2016) and relative deprivation (Zhang and Zhao, 2017) have been significantly related to suicidal ideation among young students, whereas coping strain was found to be directly associated with suicidal ideation of cancer patients (Zhang et al., 2017). Psychological strains in the form of unrealized aspiration, relative deprivation and deficient coping have also been significantly associated with suicide even after controlled for mental disorders (Zhang et al., 2011). Further, gender differences have been noted in the experience of strain. Specifically, rural males have been found to experience greater aspiration strain and deprivation strain (Sun and Zhang, 2016; Zhang et al., 2009), whereas rural females have been linked to higher levels of value strain (Sun and Zhang, 2016). The presence of gender differences in strains and their impact on mental health outcomes, however, remain unclear in urban samples in China.

Work or job stress has been a well-studied focal point in research within the field of occupational health, and several models have been developed as a result. These include, the Job Demand-Control Model (JD-C) (Karasek, 1979), the Job Demand-Control-Support (JDCS) Model (Johnson and Hall, 1988), the Effort-Reward Imbalance Model (ERI) (Siegrist, 1996), the Work-Family Conflicts Model (WFC) (Greenhaus and Beutell, 1985), the Person-Environment Fit Model (P-E fit) (French and Kahn, 1962), and the Transactional Model of Stress (Lazarus, 1989). As such, several specific factors have been found to impact the link between job stress and depression, including high job demands (Rau et al., 2010), low job control (Dragano et al., 2008), effort-reward imbalance (Pikhart et al., 2004), work-family conflict (Chandola et al., 2004), and person-environment fit (Merecz and Andysz, 2012). Further, low job control and high job demand (Milner et al., 2017), non-supportive work environments (Wallace, 2017), and work-family conflict (Yuan et al., 2012) have all been shown to increase the likelihood of suicide. However, there are several deficiencies in the research to date utilizing such models, which may limit their application. For example, the JD-C model overlooks many other mediating variables in the path from workplace demands to stress and well-being (Jiang and Ma, 2003; Jonge et al., 1999). In response, the job decision latitude and the Job Content Questionnaire (JCQ) developed based on the JDCS model need further research (Shi et al., 2010). Also, results regarding the interaction between effort-reward imbalance and over-commitment remain inconsistent and the moderating effect of over-commitment on the relation between effort-reward imbalance and work stress outcomes has been scarcely examined (Luo et al., 2011; van Vegchel et al., 2005). The Transactional Model is focused more on the individual than the organization, while the work-family conflict model might not be entirely applicable within Chinese society where a worker's role is typically more embedded within the family rather than the workplace. In this respect they may encounter more non-work related sources of stress that carry over into the workplace. In a related sense, the P-E fit model focuses on similarity or convergence between the attributes of a person and those of their environment, but this is inherently a culturally embedded construct. The "fit" here may be how appropriately the individual acts rather than their congruence with the environment (Chuang et al., 2015). This points to another important issue with these models, in that they have been based on western organization culture, and little is known about their practicality in other workplace cultures.

Given these limits of job stress models and the fact that strains are potentially more taxing than common stress, the present study was designed to go beyond stress models and focus on strain theory in understanding employee mental health. Further, given that most research on employee mental health has been conducted using western samples,

the intent was to focus on a Chinese sample. Previous use of the Strain Theory of Suicide in China has also focused on rural populations and, as such, there has been a dearth of published studies regarding psychological strain and mental health outcomes in urban China. The present study is focused on one particular workplace that is of growing concern: urban hospitals. In China today, there has been a considerable increase in public hospital reform, which has led to an escalation in demands on health care professionals. The combination of high demands and high risks, fierce market competition, high workload, and hospital-patient conflicts, has created a strenuous and arduous environment for both medical professionals and non-medical employees. As a result, strain may become more intense and problematic for many of these employees. Therefore, it is proposed that elevated strain will be associated with depressive symptoms and suicide ideation within medical and non-medical staff from urban hospitals in China.

2. Method

2.1. Sampling and procedure

The current study consisted of two samples: medical staff and non-medical employees. The same questionnaire was used to collect the information from both groups.

The medical staff were selected using purposive random sampling from among the 7000 employees of a large hospital in China. A member of the medical staff was used to help contact potential participants from different departments in the hospital and to coordinate the administration of the study. Two well-trained investigators distributed questionnaires to each respondent. In total, 1012 medical staff were recruited between July 10 and 14, 2017, with 38 omitted due to missing data, which were mainly due to incomplete demographics or inappropriate response patterns (e.g. repetitively reporting the same response to all questions).

The collection of data for the non-medical staff was carried out by the Chinese professional online survey company *Questionnaire Star*. Both the Principal Investigator and Questionnaire Star signed a contract and the company administered the questionnaires for a fee. The non-medical staff were limited to formal employees (i.e. office staff but excluding interns) between the ages of 18 and 65 years of age in the same urban areas as the medical staff. The same questionnaire was distributed between September and October 2017. The quality control methods of the online survey were as follows: (1) The questionnaire was sent to users that met the selection requirements; (2) Screening items were set to verify that participants met the sample qualifications; (3) The online system was used to monitor the process, including the IP addresses, the same electronic device being used, trap items, time limits, sampling procedures etc.; (4) The investigators performed a quality check for completeness, formatting, and effectiveness of the data recording, one by one after the questionnaires were completed. 37 questionnaires were omitted for not meeting these data requirements. Finally, a total of 1058 employee submitted suitable questionnaires for analyses.

This study protocol was approved by the Medical Ethical Committee of Qilu Hospital, the Ethics Committee of Shandong University, and the Ethics Committee of Central University of Finance and Economics where the Principal Investigator is affiliated. All participants signed a written informed consent after they were selected.

2.2. Measurements

2.2.1. Socio-demographic factors

Age was measured by date of birth. Gender was coded as female [0] or male [1]. Marital status was categorized as "0 = single" [including not married and cohabitation] or "1 = ever married" [including married, remarried, separate but not divorced, divorced, and widowed]. Education was measured as "0 = below university" [including no

Table 1

Description and comparison of the two samples on major variables for study (medical staff: n = 1012, non-medical employees: n = 1051).

Variable	Medical staff				Non-medical employees			
	Total(n = 1012)	Male (n = 237)	Female (n = 775)		Total (n = 1051)	Male (n = 459)	Female (n = 592)	
	M ± SD/f (%)	M ± SD/f (%)	M ± SD/f (%)	t/χ^2	M ± SD/f (%)	M ± SD/f (%)	M ± SD/f (%)	t/χ^2
Age	33.89 ± 8.42	35.90 ± 9.70	33.28 ± 7.90	3.793***	36.48 ± 8.06	36.14 ± 8.53	36.75 ± 7.67	−1.202
Education				12.690***				1.319
Below college	133 (13.2)	47 (20.1)	86 (11.1)		351 (33.4)	162 (35.3)9	189 (31.9)	
College and above	876 (86.8)	187 (79.9)	689 (88.9)		700 (66.6)	297 (64.7)	403 (68.1)	
Marital status				1.205				8.172**
Single	249 (24.6)	52 (21.9)	197 (25.5)		270 (25.7)	138 (30.1)	132 (22.3)	
Married	762 (75.4)	185 (78.1)	577 (74.5)		781 (74.3)	321 (69.9)	460 (77.7)	
Occupation				44.151***				0.988
Management	82 (8.1)	32 (13.6)	50 (6.5)		409 (38.9)	172 (37.5)	237 (40.0)	
Professional	854 (84.6)	168 (71.2)	686 (88.6)		479 (45.6)	217 (47.3)	262 (44.3)	
Service	74 (7.3)	36 (15.3)	38 (4.9)		163 (15.5)	70 (15.3)	93 (15.7)	
Title				30.551***				3.632
Primary and no title	634 (63.2)	130 (55.8)	504 (65.5)		520 (49.5)	225 (49.0)	295 (49.8)	
Intermediate	296 (29.5)	67 (28.8)	229 (29.7)		168 (16.0)	64 (13.9)	104 (17.6)	
Senior	73 (7.3)	36 (15.5)	37 (4.8)		363 (34.5)	170 (37.0)	193 (32.6)	
Working hours				51.754***				46.671***
≤ 40 h	268 (26.6)	44 (18.8)	224 (29.0)		356 (33.9)	116 (25.3)	240 (40.5)	
41–50 h	462 (45.9)	83 (35.5)	379 (49.0)		474 (45.1)	211 (46.0)	263 (44.4)	
51–60 h	142 (14.1)	54 (23.1)	88 (11.4)		148 (14.1)	81 (17.6)	67 (11.3)	
61–70 h	66 (6.6)	28 (12.0)	38 (4.9)		37 (3.5)	28 (6.1)	9 (1.5)	
> 70 h	69 (6.9)	25 (10.7)	44 (5.7)		36 (3.4)	23 (5.0)	13 (2.2)	
Religion				2.995				3.457
Yes	78 (7.8)	20 (8.6)	58 (7.5)		198 (18.8)	78 (17.0)	120 (20.3)	
No	821 (81.9)	195 (84.1)	626 (81.3)		781 (74.3)	354 (77.1)	427 (72.1)	
Not sure	103 (10.3)	17 (7.3)	86 (11.2)		72 (6.9)	27 (5.9)	45 (7.6)	
Social support	60.39 ± 10.07	60.31 ± 11.66	60.41 ± 9.54	−0.120	60.81 ± 11.87	60.40 ± 12.25	61.12 ± 11.56	−0.979
Psychological strain	97.26 ± 26.46	95.16 ± 28.60	97.88 ± 25.78	−1.253	93.60 ± 28.21	96.75 ± 29.11	91.15 ± 27.26	3.210**
Value strain	24.93 ± 7.42	24.41 ± 7.78	25.08 ± 7.31	−1.182	23.94 ± 8.02	24.89 ± 8.34	23.21 ± 7.69	3.386**
Aspiration strain	25.11 ± 8.11	24.37 ± 8.59	25.32 ± 7.95	−1.552	24.47 ± 8.66	25.15 ± 8.85	23.95 ± 8.48	2.232*
Deprivation strain	24.45 ± 7.79	24.74 ± 8.50	24.36 ± 7.56	0.614	23.28 ± 7.90	24.49 ± 8.16	22.35 ± 7.57	4.390***
Coping strain	23.24 ± 7.08	22.51 ± 7.59	23.47 ± 6.91	−1.820	21.90 ± 7.62	22.23 ± 7.62	21.64 ± 7.16	1.287
Depressive symptoms	28.87 ± 23.79	30.60 ± 26.03	28.35 ± 23.08	1.152	25.22 ± 23.39	26.52 ± 24.32	24.22 ± 22.62	1.580
Suicidal ideation	0.42 ± 1.00	0.50 ± 1.10	0.39 ± 0.96	1.352	0.52 ± 1.03	0.47 ± 0.98	0.55 ± 1.06	−1.317

Note.
* $p < 0.05$
** $p < 0.01$
*** $p < 0.001$

formal education, elementary school, middle school, vocational school, high school, special secondary school, technical school and junior college] or "1 = bachelor degree and above" [including university, graduate and above]. Occupation was coded as "1 = management position", "2 = professional position" or "3 = service position" . Title was re-coded into "1 = primary/no title", "2 = intermediate title" or "3 = senior title" . Weekly working hours was measured by five choices: "1 = less than or equal to 40 h", "2 = 41–50 h", "3 = 51–60 h", "4 = 61–70 h" or "5 = more than 70 h" . Religion was coded as "1 = yes" [including Catholicism, Christian, Judaism, Islamism, Taoism, Buddhism and others], "2 = no" or "3 = not sure".

2.2.2. Questionnaire instruments

The Multidimensional Scale of Perceived Social Support (MSPSS) is a 12-item self-report inventory designed to assess perceptions of social support adequacy from three specific sources: family, friends, and significant others (Zimet et al., 1988). In this study, the Cronbach alpha coefficients for the scale were 0.956 in medical staff and 0.943 in non-medical employees, respectively.

The Psychological Strain Scale (PSS) is a 40-item scale designed to measure the psychological strains that have been experienced by the respondents (Zhang et al., 2014; Zhang and Lyu, 2014). The PSS consists of 4 subscales: value strain, aspiration strain, relative deprivation strain and coping strain. Each subscale includes 10 items with response ratings for each item ranging from 1 = "never, it's not me", 2 = "rarely, it's not me", 3 = "maybe, I'm not sure", 4 = "often, it's like me" to 5 = "yes, it's exactly me". The total score of the PSS was the sum of

each subscale, with higher scores indicating greater strain. The alpha coefficients for the total PSS were 0.969 in medical staff and 0.968 in non-medical employees.

The Center for Epidemiologic Studies Depression Scale (CES-D) is a 20-item self-report scale designed to measure depressive symptoms in the general population (Radloff, 1977). In the present study, the 4-point Likert scale was extended to an 8-point Likert scale, with 0 as none of the seven days and 1–7 representing the number of the days the respondent experienced the symptoms associated with depression in the past week. In this study, the internal consistency was high with Cronbach's alphas of 0.927 for medical staff and 0.937 for non-medical employees.

Suicidal behaviors were assessed using questions from the life-event history section of the National Comorbidity Survey (NCS) interview (Kessler et al., 1994). Respondents were asked about the lifetime and past 12-month occurrence of suicidal ideation, suicide plans and suicide attempts. Respondents who reported making a 12-month attempt were asked to choose one statement that best describe the lethality of suicidal intent: (1) I made a serious attempt to kill myself and it was only luck that I did not succeed; (2) I tried to kill myself but I knew the method was not foolproof; (3) My attempt was a cry for help, I did not want to die. Those who endorsed statement 1 and 2 were considered to have made a suicide attempt [1], and those who endorsed statement 3 were considered to have made a suicide gesture [0] (Nock and Kessler, 2006). The present study used the sum of the seven items to identify "suicidal ideation".

2.3. Statistical analysis

All data were analyzed using IBM SPSS Statistics, version 24.0. T-tests were performed for continuous variables and Chi-Square tests were performed for categorical variables. Separate multiple linear regressions were conducted to determine the potential links for depression and suicide ideation in medical staff and non-medical employees. All p values were two-tailed and p values < 0.05 was considered statistically significant.

3. Results

The respondents were comprised of 1012 medical staff and 1051 non-medical staff employees, respectively, with a 96.4% (1012/1050) and 96.6% (1051/1088) retention rate. The socio-demographic characteristics are presented in Table 1. Females outnumbered males in both samples, comprising 76.6% of respondents in the medical staff and 56.3% in the non-medical staff. The ages ranged from 19–63 years in the medical staff and 18–65 in the non-medical employees. Both groups showed similar demographic tendencies, including college education or above, ever married, no religion, in professional positions, having primary/no title, working 41–50 on average per week.

Initially a comparison was conducted across gender due to the fact that previous research has noted the potential for gender differences in the experience of strains among rural samples in China (Sun and Zhang, 2016), yet has not been examined in urban participants. In terms of demographics of this sample, the medical staff males were on average older, served in more management and service positions, held more senior titles, and worked more hours, while females held more college and above education, served in more professional roles, and held more primary/no title. However, there were no significant differences in four types of psychological strains between genders in medical staff. In the non-medical sample, males were more likely to be single, to work more hours, to report greater overall strain, value strain, aspiration strain, and deprivation strain. No differences were found in either sample across gender regarding social support, depressive symptoms and suicidal ideation.

All other variables in Table 1 were included in regression models. Stepwise multiple linear regression analyses were performed to examine the significant factors associated with depressive symptoms and suicidal ideation in the two samples respectively. As presented in Table 2, both Model 1 and Model 2 show that younger age ($p < 0.01$),

longer working hours ($p < 0.01$), less social support ($p < 0.001$), professional position ($p < 0.01$), aspiration strain ($p < 0.001$) and coping strain ($p < 0.001$) were significantly linked to depressive symptoms in both medical and non-medical samples. Higher title ($p < 0.01$) and value strain ($p < 0.05$) were significantly associated with depression in medical staff (Model 1), while having college or higher education ($p < 0.001$) and holding religious beliefs ($p < 0.001$) were significantly associated with depression in non-medical staff (Model 2). In Model 3 and Model 4, longer working hours ($p < 0.01$) and depression ($p < 0.001$) were significantly linked to suicidal ideation in both samples. Coping strain ($p < 0.001$) was significantly associated with suicidal ideation in medical employees (Model 3), whereas value strain ($p < 0.01$), gender ($p < 0.01$), and no religion ($p < 0.05$) were significantly associated with suicidal ideation in non-medical employees (Model 4).

4. Discussion

This study was intended to test the Strain Theory of Suicide in two separate urban samples of adult employees in China. As expected, strain showed a significant link to negative psychopathology in both medical and non-medical samples, although some interesting patterns emerged. Specifically, aspiration strain and coping strain were significantly associated with depressive symptoms in both samples, while coping strain was related to suicidal ideation in the medical staff only. Further, value strain was linked with depression in the medical staff but suicidal ideation in the non-medical staff. These findings show consistency with other samples in China (Zhang et al., 2016; Zhang and Lv, 2014).

Aspiration strain may be linked to depression in this context because of the competitive structure of the Chinese medical system. There are many factors that motivate individuals towards pursuing a career in the healthcare field, including meaningfulness of work, job achievements, remuneration, respect, prestige, job pride, meaningful interactions with co-workers, job control, opportunities for advancement, and life satisfaction (Lambrou et al., 2010). However, there may be many personal and situational factors that prevent the achievement of these goals and aspirations. For example, there may be limited opportunities to advance within a hospital, or the requirements may become so restrictive or unrealistic given the large number of physicians, nurses, or office staff that many never realize these aspirations; hospital administration may demand greater working hours to show job "achievement" which may debilitate many who also have other roles and

Table 2

Linear regression for depressive symptoms and suicidal ideation (medical staff: $n = 1012$, non-medical employees: $n = 1051$).

| Variable | Depressive symptoms | | | | | | Suicidal ideation | | | | | |
| | Medical Staff (Model 1) | | | Non-Medical Employees (Model 2) | | | Medical Staff (Model 3) | | | Non-Medical Employees (Model 4) | | |
	β	t	p	β	t	p	β	t	p	β	t	p
Age	−0.342	−3.472	0.001	−0.275	−3.958	< 0.001						
Female gender										−0.166	−2.700	0.007
College and above				4.027	3.372	0.001						
Professional position	3.786	2.087	0.037	−3.173	−2.852	0.004						
Primary and no title	−4.295	−2.716	0.007									
Long working hours	3.610	6.672	< 0.001	1.821	3.177	0.002	0.088	3.349	0.001	0.111	3.511	< 0.001
Religion (Yes)				5.490	3.896	< 0.001						
Religion (No)										−0.151	−2.200	0.028
Social support	−0.502	−7.637	< 0.001	−0.491	−9.734	< 0.001						
Value strain	0.283	2.296	0.022							0.012	2.927	0.004
Aspiration strain	0.673	6.021	< 0.001	0.532	5.944	< 0.001						
Coping strain	0.729	5.738	< 0.001	1.103	10.378	< 0.001	0.028	5.706	< 0.001			
Depression							0.011	7.182	< 0.001	0.012	8.705	< 0.001
Constant	21.055	2.817	0.005	22.196	4.237	< 0.001	−0.740	−6.350	< 0.001	−0.113	−0.916	0.360
R^2	$R^2 = 0.438$, Adjusted $R^2 = 0.433$			$R^2 = 0.431$, Adjusted $R^2 = 0.427$			$R^2 = 0.194$, Adjusted $R^2 = 0.192$			$R^2 = 0.138$, Adjusted $R^2 = 0.133$		
	$F = 87.504$, $p < 0.001$			$F = 98.557$, $p < 0.001$			$F = 72.578$, $p < 0.001$			$F = 33.316$, $p < 0.001$		

responsibilities in their families and communities; financial pressure on hospitals may force administration to keep salaries lower for all employees; or employees may be limited in their ability to switch hospitals or departments or areas of specialty which fit their goals more specifically. The greater number of these hurdles that both medical and non-medical staff experience, the greater the likelihood that they feel incapable of reaching their aspirations. The resulting strain may then, in turn, be internalized and create depression and ultimately suicidal ideation.

The high levels of stress among medical employees would necessitate effective coping strategies. Coping strain would then be a function of either the inability to personally form techniques to minimize stress, or barriers from within the system that prevent employees from coping effectively. In many respects, direct coping (dealing directly with a source of stress) is generally the most effective way of dealing with stressors (Hennessy and Wiesenthal, 1997). Research has confirmed that more effective coping approaches (e.g. taking time away, discussions with colleagues, exercising) in the healthcare field can reduce negative outcomes such as exhaustion (Lemaire and Wallace, 2010). In fact, previous studies have demonstrated that both avoidance and emotion focused coping strategies are associated with poor mental health, anxiety, and depression (Alosaimi et al., 2016; Nelson and Smith, 2016). As ineffective coping attempts compound over time among both medical and non-medical staff, and the resulting strain builds, individuals may become less purposive in trying to effectively deal with their stressors which may then become internalized as depression. This may be even more deleterious among medical staff who showed a link between ineffective coping and suicidal ideation in the present study. In light of the immense pressure that medical employees endure, and the multiple sources of stress encountered on a daily basis, this is particularly troubling given that the likelihood of successful resolution of the bulk of their stressors seems highly unlikely. It is important, then, that hospital administrators work with employees in efforts to help deal with coping strain to reduce the risk of depression and suicide.

Value conflict is evident in the medical field in China where many patients and practitioners still hold to the promise of traditional medical practices. In many instances, the pursuit of more modern and technologically based practices may be seen as less personal and intimate – less caring as the patient and practitioner simply enter a transaction rather than a relationship – which might alter how patients perceive the quality of care and practitioners view the success of their efforts. Additionally, given that many working in this field are females, there is a potential that traditional family roles are challenged or that the women in these roles still must maintain their traditional family caregiving responsibilities. This work-family role conflict in two-career families has been found to increase depression (Keith and Schafer, 1980). In fact, it is possible that many working in a more modern medical facility will have families who cherish traditional approaches, which can create familial conflict and further exaggerate the level of value strain. The result of this strain in the present study was increased depression among medical staff and suicidal ideation among non-medical staff. Chinese hospitals should carefully consider how to effectively navigate the balance between the benefits of traditional values alongside the rapid progression towards modern practices, and its impact on both patients and staff. In this way, a human-oriented organizational culture should be promoted for the future advancement of the medical system in China.

Although not specifically predicted, it is noteworthy that some gender differences did emerge. For example, males in the non-medical sample showed higher levels of strain overall, as well as greater value, aspiration, and deprivation strain compared to females. In a related sense, males worked longer hours in both samples. This pattern has been previously found to exist across all levels of education although the gap declines with level of education (Liu et al., 2017). This discrepancy may be due to greater cultural pressure for males to exert themselves as the economic leader in the family, to be more dominant in their roles at work, to work harder and longer as a means to rapid career advancement, or to acquire respect and admiration from their peers, family, and society. Future research may benefit from a deeper evaluation of how gender is part of the process of how strain impacts negative outcomes such as psychopathology in the workplace.

One limitation in the present study was that all medical staff were from one general hospital, so caution should be practiced in generalizing the results to all hospitals in China. Secondly, the cross-sectional design limits the ability to make causal attributions between psychological strains and psychopathologies. Future research is still needed to potentially include longitudinal tracking of these factors with specific controls for other mitigating factors, and the inclusion of other negative outcomes. Another consideration is that depressive disorders were not specifically assessed, given that a clinical diagnosis is different from identification of depressive symptoms. As such, depressive disorders can be the result of a combination of biological, environmental and psychological factors (Wittchen, 1998; Zalsman et al., 2006), so future research may benefit from the inclusion of specific diagnoses. In a related sense, common method bias may have been present due to the exclusive use of self-reports. Future research may benefit from more objective evaluations of psychopathologies in particular. Lastly, work-related anxiety is a growing area of concern in occupational health. Anxiety disorders were moderately related to work-related anxieties which were shown in the form of panic, phobia, social phobia and generalized anxiety (Linden and Muschalla, 2007). Different professional settings had different work anxieties, and medical staff often suffered from insufficiency, adjustment disorders, posttraumatic stress disorder and workplace phobia (Muschalla and Linden, 2013). Health service providers have intensive interaction with patients and their relatives in health sectors, work-related anxiety was found to be significantly associated with job demand and work-related stress (Jones et al., 2015), so it was potentially related to strain, which should be included in follow-up studies.

5. Conclusion

In sum, the current study found support for the Strain Theory of Suicide, in that psychological strains were linked with depressive symptoms and suicidal ideation in medical and non-medical staff. Aspiration strain and coping strain were significantly associated with depression in both samples. Coping strain was also linked to suicidal ideation in the medical staff sample. Value strain was significantly associated with depression in medical staff, and with suicidal ideation in non-medical employees. In addition, male non-medical employees showed higher value strain, aspiration strain and relative deprivation strain compared to female non-medical employees, while longer working hours were associated with an increase in depression and suicidal ideation across both samples.

Conflict of interest

All the authors declare that they have no conflicts of interest.

Contributors

Author Liu Yanzheng undertook the literature review, statistical analysis and wrote the first draft of the manuscript. Author Zhang Jie designed the study and gave Liu Yanzheng many instructions when he encounters questions such as data analysis and written English. Author Dwight A. Hennessy edited the English and provided many suggestions to this manuscript. Author Sibo Zhao and Haoyi Ji helped collect the data. All authors contributed to and have approved the final manuscript.

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