Work-Family Conflict, Social Support, Depression and Suicidal Ideation among Medical Staffs in Shandong, China: A Conditional Process Analysis

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Abstract

Background Suicidal ideation has been explored in different populations. However, few studies were conducted among medical staff. Besides, the effect of work-family conflict on suicidal ideation was less reported in previous studies. In the current study, we aim to clarify the relations among work-family conflict, social support, depression, and suicidal ideation for Chinese medical staffs.

Methods We collected 3,426 valid questionnaires based on a cross-sectional design. Suicidal ideation, work-family conflict, social support, depression, social-demographic characteristics, and work-related variables were evaluated. Conditional process analysis was used to analyze the association among these variables.

Results We found that factors associated with lifetime suicidal ideation were male (OR=0.54), doctor (OR=4.32), physical disease (OR=1.58), work-family conflict (OR=1.03), and depression (OR=1.09). Factors associated with one-year suicidal ideation were male (OR=0.46), doctor (OR=4.21), master (OR=1.79), physical disease (OR=1.51), work-family conflict (OR=1.02), and depression (OR=1.10). Depression can mediate the association between work-family conflict and suicidal ideation, but mediate effect of social support was not supported in the current study.

Conclusion We should pay more attention to work-family conflict problems, and depression is an important factor associated with suicidal ideation among Chinese medical staff. Both of them should be scanned for identification and treatment of suicide.

1. Introduction

In recent decades, suicide has been recognized as an important problem in the world. According to the WHO estimates, there were 800,000 deaths by suicide in 2012 [1], and it implies that every 40 seconds a person dies by suicide somewhere in the world. In China, although the recent suicide rates have decreased significantly [2], it is still a major public health and social problem with a heavy burden of disease [3].

Suicidal ideation, an important predictor for the following suicide attempt and death [4, 5], have also been explored in different populations in the world, such as community residents [6, 7], military personnel [8, 9], college students [10], and occupational populations [11, 12]. For occupational populations, we have found many job characteristics that were associated with suicidal ideation in previous studies, such as working hours [13], work conditions [14], shift work [15].

However, few studies were conducted to explore these associations among medical staff. In Sweden and Italy, the association between work stress and suicidal ideation was supported by female university hospital physicians. In China, a study supports the relationship between long work hours and suicidal ideation [16]. Another study found the association between work burnout and suicidal ideation among nurses [17]. The relationship between jor stress and suicidal ideation is also identified in Chinese county-level hospitals [18].

Work-family conflict is another important topic, which has been well studied in previous years. The effect of work-family conflict on depression has been identified in American training physicians [19], Japanese working women [20], and so on [21]. In addition, as the strong effect of depression on suicidal ideation [22, 23], we have enough reasons to believe the association between work-family conflict and suicidal ideation. It also implies the mediating effect of depression on the association between work-family conflict and suicidal ideation. However, to our knowledge, this association and mediating effect are not tested in previous studies.

Social support is another factor associated with suicidal behavior, which has been found in many previous studies worldwide [24–26]. A study in South Korea supports the mediating role of social support on the relationship between work-family conflict and emotional exhaustion [27]. As the proved association between emotional exhaustion and depression [28], we can also assume the possible mediating role of social support on the association between work-family conflict and

suicidal ideation. Thus, we have enough reasons to presume the mediating effect of social support and depression on the association between work-family conflict and suicidal ideation.

In the current study, we aim to explore the association between work-family conflict and suicidal ideation, and we want to clarify the relationships among work-family conflict, social support, depression, and suicidal ideation. It is not only helpful for us to understand the association between work-family conflict and suicidal ideation among medical staff but also helpful for us to further make some strategies to prevent suicide behavior among medical staff. The results may be translated into practical measures in suicide prevention in China as well as elsewhere in the world.

2. Methods

2.1 Setting and participants

This was a cross-sectional study conducted in Shandong province, China. Shandong located in the East of China, and the population rank second in all of the Chinese provinces [29]. In Shandong, the number of health workers also ranks first in China [30]. To assess the prevalence of suicidal ideation, a multiple stratified random cluster sampling method was used to select the subjects. In the first stage, all of the 17 cities were categorized into three groups according to the GDP per capita in 2017. We randomly selected one city from each group (Qingdao, Dezhou, Zaozhuang). In the second stage, three counties or districts were randomly selected from each city. In the third stage, one hospital was randomly selected in each city and county. Totally, we selected 12 hospitals in the three cities (3 city-level hospitals and 9 county-level hospitals). In the fourth stage, we randomly selected three inpatient areas from each department in each city-level hospital. For the county-level hospital, we randomly selected two inpatient areas from each department in each hospital. All of the medical staff working on the interview date were employed in the interview. Finally, we collected 3,426 valid questionnaires in the current study.

2.2 Data collection

The interview was conducted from November 2018 to January 2019. The questionnaire was sent to the medical staff individually, and they can fill it anonymously when they are free for the work. Two trained postgraduate students were in the hospital to answer the questions and collect the questionnaires on the interview date.

2.3 Measures

2.3.1 Suicidal ideation

Lifetime suicidal ideation was evaluated by the question that "Have you ever seriously thought about committing suicide?" and one-year suicidal ideation was assessed by the question that "Have you seriously thought about committing suicide in the last 12 months?" The answers can choose from yes or no. Subjects who responded yes were seen as the presence of suicidal ideation. Both of the questions have been used in many previous studies to evaluate suicidal ideation, such as the National Comorbidity Survey (NCS) [31], Chinese elderly [32], and so on [33, 34].

2.3.2 Work-family conflict

Work-family conflict was assessed by the Physician Work-Family Conflict Scale developed by a Chinese research group [35]. It contains nine items to measure work-to-family conflict, family-to-work conflict and balance of work and family. A sample item was that "I often missed family activities because I should spend time at work." Participants were asked to rate the level from 1 (very disagree) to 5 (very agree). It was also used in previous Chinese studies [36]. In the current study, this scale had high internal consistency (α = 0.916).

2.3.3 Social support

The Multidimensional Scale of Perceived Social Support (MSPSS) was used to measure social support in the current study [37, 38]. The Chinese 12-item version of the scale was tested with sound validity and reliability among Chinese adolescents

[39]. The answer can choose from 1 (strongly disagree) to 7 (strongly agree). The total score (ranged from 12 to 84) was analyzed in the present study. High internal consistency was also supported by the current study (α = 0.958).

2.3.4 Depression

The Chinses version of the Center for Epidemiologic Studies-Depression Scale (CES-D) was used to assess the level of depression symptoms in the current study [40]. This scale contained 20 items, and it had been validated with excellent measures in many previous Chinese studies [41, 42]. Subjects responded to their feeling for the number of days in the past 1 week. The answers were 0 (< 1 day), 1 (1−2 days), 2 (3−4 days) and 3 (5−7 days). Cronbach's alpha was 0.852 in the current study.

2.3.5 Coping skill

The coping skill was measured by the Coping Response Inventory (CRI) [43]. It was a 48-item scale that included two subscales (approach coping and avoidance coping). The Chinese version of CRI had been used in many previous suicide studies, and the reliability was also proved [44, 45]. In the present study, Cronbach's alpha was 0.873 for CRI.

2.3.6 Physical disease

Physical disease was evaluated by a question asking if the participants have any physical disease. The answer was yes (1) and no (0).

2.3.7 Social-demographic variables

Gender was measured by male (1) and female (0). Age was assessed by the date of birth for the participants, and we calculated their age until the date we interviewed. Married status was estimated by single, married, divorced, widowed and others. As there were few subjects divorced or widowed, we categorized into single, married and others. Education was evaluated by the academic degree they received. The answers were doctor, master, bachelor, and others.

2.3.8 Work-related variables

As we interviewed three kinds of medical staff in the current study, the types of medical staff were doctors, nursing and medical technician. The professional title was measured by senior, vice-senior, intermediate, and junior and others. The manager was evaluated by yes (1) or no (0) with the former contained director of the hospital, vice-director of the hospital, director of the department, vice-director of the department, head nurse and deputy nurse.

2.4 Statistical analysis

In the current study, IBM SPSS Statistics 24.0 (Web Edition) was used to analyze the data. For comparing the differences between subjects with or without suicidal ideation, t-tests or Chi-square tests were performed. Backward logistic regression was conducted to examine the factors associated with suicidal ideation. Conditional process analysis was used to analyze the associations among work-family conflict, depression, social support, and suicidal ideation [46]. The SPSS macros program (PROCESS v3.3) developed by Andrew F. Hayes was used to conduct the conditional process analysis. As the association among these variables, Model 6 was performed in the current study [47]. All of the tests were two-tailed and a p-value of ≤ 0.05 was considered statistically significant.

3. Results

In the current study, we totally interviewed 3,426 medical staff in Shandong province, China. The estimated lifetime and one-year prevalences of suicidal ideation were 9.1% (312/3,426) and 7.0% (239/3,426), respectively. The detailed distribution was shown in the second column in Table 1. In Table 1, we also conducted single analyses to compare the differences in suicidal ideation for each variable. For lifetime suicidal ideation, the associated factors were gender, married status, education, manager, physical disease, work-family conflict, social support, and depression. For the one-year suicidal ideation,

the associated factors were gender, age, married status, education, physical disease, work-family conflict, social support, and depression.

In Table 2, backward logistic regressions were used to identify the factors associated with lifetime and one-year prevalence of suicidal ideation among medical staff. As the importance of depression in suicidal ideation, we analyzed the factors without depression in Model A1 and B1. However, when depression was added into the regressions, social support and age disappeared in the regressions. The associated factors for lifetime suicidal ideation were male (OR=0.54), doctor (OR=4.32), physical disease (OR=1.58), work-family conflict (OR=1.03), and depression (OR=1.09). The associated factors for one-year suicidal ideation were male (OR=0.46), doctor (OR=4.21), master (OR=1.79), physical disease (OR=1.51), work-family conflict (OR=1.02), and depression (OR=1.10).

To further understand the mechanism of work-family conflict, depression, social support, and suicidal ideation, conditional process analysis was used to analyze the relationships among them. As the illustration in the Introduction section, we built the models as shown in Fig. 1 and 2. After controlling gender, age, married status, education, and physical disease, the coefficients were displayed in Fig 1 and 2. In Table 3, we listed the direct and indirect effect of work-family conflict, depression, and social support on lifetime and one-year suicidal ideation. The results supported that work-family conflict had an indirect effect (48.0%, 0.0255/0.0531) on lifetime suicidal ideation. For one-year suicidal ideation, the percentage of the indirect effect of work-family conflict was 55.8% (0.0285/0.0511), and the number was 68.7% (-0.0244/-0.0355) for social support.

Table 1: Lifetime and 1-year prevalence of suicidal ideation among medical staffs [n (%)/Mean±SD]

	Total	Lifetime prevalence			One-year prevalence		
		Yes	No	t/χ^2	Yes	No	t/χ^2
All	3426 (100.0)	312 (9.1)	3114 (90.9)	–	239 (7.0)	3187 (93.0)	–
Gender				5.62*			6.71**
Male	919 (26.8)	66 (21.2)	853 (27.4)		47 (19.7)	872 (27.4)	
Female	2507 (73.2)	246 (78.8)	2261 (72.6)		192 (80.3)	2315 (72.6)	
Age	35.14±8.42	34.30±7.22	35.23±8.53	-1.85	34.08±7.40	35.22±8.49	-2.03*
Married Status				6.82*			7.97*
Single	577 (16.8)	69 (22.1)	508 (16.3)		56 (23.4)	521 (16.3)	
Married	2802 (81.8)	239 (76.6)	2563 (82.3)		180 (75.3)	2622 (82.3)	
Others	47 (1.4)	4 (1.3)	43 (1.4)		3 (1.3)	44 (1.4)	
Education				12.24**			10.20*
Doctor	56 (1.6)	12 (3.8)	44 (1.4)		9 (3.8)	47 (1.5)	
Master	562 (16.4)	54 (17.3)	508 (16.3)		45 (18.8)	517 (16.2)	
Bachelor	2368 (69.1)	214 (68.6)	2154 (69.2)		162 (67.8)	2206 (69.2)	
Others	440 (12.8)	32 (10.3)	408 (13.1)		23 (9.6)	417 (13.1)	
Types of medical staff				0.18			1.09
Doctor	1268 (37.0)	112 (35.9)	1156 (37.1)		83 (34.7)	1185 (37.2)	
Nursing	1695 (49.5)	157 (50.3)	1538 (49.4)		126 (52.7)	1569 (49.2)	
Medical technician	463 (13.5)	43 (13.8)	420 (13.5)		30 (12.6)	433 (13.6)	
Professional title				3.10			3.29
Senior	109 (3.2)	7 (2.2)	102 (3.3)		5 (2.1)	104 (3.3)	
Vice-senior	303 (8.8)	21 (6.7)	282 (9.1)		16 (6.7)	287 (9.0)	
Intermediate	1170 (34.2)	112 (35.7)	1058 (34.0)		79 (33.1)	1091 (34.2)	
Junior and others	1844 (53.8)	172 (55.1)	1672 (53.7)		139 (58.2)	1705 (53.5)	
Manager				5.12*			3.49
Yes	659 (19.2)	45 (14.4)	614 (19.7)		35 (14.6)	624 (19.6)	
No	2767 (80.8)	267 (85.6)	2500 (80.3)		204 (85.4)	2563 (80.4)	
Physical disease				33.99***			26.55***
Yes	457 (13.3)	75 (24.0)	382 (12.3)		58 (24.3)	399 (12.5)	

	Total	Lifetime prevalence			One-year prevalence		
		Yes	No	t/χ^2	Yes	No	t/χ^2
No	2969 (86.7)	237 (76.0)	2732 (87.7)		181 (75.7)	2788 (87.5)	
Work-family conflict	29.62±9.28	32.85±8.41	29.30±8.19	7.30***	32.80±8.46	29.38±8.21	6.20***
Social support	62.46±13.82	56.94±14.65	63.01±13.61	-7.45***	55.90±15.02	62.95±13.60	-7.67***
Coping skill	30.63±9.83	30.81±10.17	30.61±9.79	0.35	30.86±9.88	30.61±9.82	0.39
Depression	14.72±10.38	24.77±11.64	13.71±9.69	18.85***	26.26±11.70	13.85±9.74	18.71***

Note: SD refers to standard deviation. * means p<0.05. ** means p<0.01. *** means p<0.001.

Table 2: Backward logistic regression analysis for the Lifetime and 1-year prevalence of suicidal ideation among medical staffs [OR (95% CI)]

	Lifetime prevalence		One-year prevalence	
	Model A1[#]	Model A2	Model B1[#]	Model B2
Male	0.65 (0.48, 0.88)**	0.54 (0.39, 0.74)***	0.58 (0.41, 0.82)**	0.46 (0.32, 0.66)***
Age	0.98 (0.96, 0.98)**	–	0.97 (0.95, 0.99)**	–
Married status (Ref.=others)				
Single	--	1.76 (0.56, 5.60)	–	1.88 (0.51, 6.98)
Married	--	1.16 (0.37, 3.62)	–	1.16 (0.32, 4.20)
Education (Ref.=others)				
Doctor	3.78 (1.75, 8.19)***	4.32 (1.93, 9.63)***	3.65 (1.52, 8.79)**	4.21 (1.69, 10.49)**
Master	1.36 (0.84, 2.18)	1.43 (0.87, 2.34)	1.66 (0.97, 2.85)	1.79 (1.02, 3.15)*
Bechelor	1.16 (0.78, 1.73)	1.22 (0.81, 1.84)	1.24 (0.78, 1.97)	1.31 (0.81, 2.12)
Physical disease	2.14 (1.58, 2.91)***	1.58 (1.15, 2.16)**	2.16 (1.54, 3.02)***	1.51 (1.06, 2.15)*
Work-family conflict	1.05 (1.04, 1.07)***	1.03 (1.01, 1.05)***	1.05 (1.03, 1.07)***	1.02 (1.00, 1.04)*
Social support	0.97 (0.96, 0.98)***	–	0.97 (0.96, 0.98)***	–
Depression	--	1.09 (1.08, 1.10)***	–	1.10 (1.09, 1.12)***
Constant	0.21**	0.01***	0.24**	0.004***
R^2	0.10	0.20	0.10	0.22

Note: #: the models were analyzed without depression. Ref. means reference. * means $p<0.05$. ** means $p<0.01$. *** means $p<0.001$.

Table 3: Direct and indirect effect of work-family conflict, social support, and depression on suicidal ideation among medical staffs

	Lifetime suicidal ideation			One-year suicidal ideation		
	Direct effect	Indirect effect	Total effect	Direct effect	Indirect effect	Total effect
Work-family conflict	0.0276	0.0255	0.0531	0.0226	0.0285	0.0511
Social support	-0.0087	-0.0218	-0.0305	-0.0111	-0.0244	-0.0355
Depression	0.0816	–	0.0816	0.0911	–	0.0911

4. Discussion

In the current study, we found that the lifetime and one-year prevalence of suicidal ideation among medical staff were 9.1% and 7.0%, respectively. It is higher than the prevalence among Chinese community residences [48], but similar findings are supported by studies among medical college students who are the potential medical staff in China and other countries [49, 50]. It may be explained by the work characteristics of medical staff, and they need to meet death in their daily works, which may cause emotional problems.

The results also support the association between work-family conflict and suicidal ideation. Although the previous studies have identified the association between job characteristics and suicidal ideation, such as work hours, job stress and so on [51-53]. To our knowledge, the association between work-family conflict and suicidal ideation is not reported. The reasons are easy to understand because of the effect of work-family conflict on mental health [54]. As the importance of family in Chinese traditional culture [55], the effect of work-family conflict may be more serious on suicidal ideation.

We also found that social support was related to suicidal ideation, and the effect was mediated by depression. The roles of social support and depression on suicidal ideation have been identified in many previous studies [56], and the mediating effect of depression is also supported among different populations [57, 58]. However, our results support that depression can completely mediate the association between social support and lifetime suicidal ideation, and it is a partial mediating effect for one-month suicidal ideation. It implies that the effect of social support may not persist in long time.

The main aims for the current study were to analyze the associations among work-family conflict, social support, depression, and suicidal ideation. The results support that the effect of work-family conflict and social support on suicidal ideation can be mediated by depression among Chinese medical staff. It also implies that we should pay more attention to work and family problems when controlling and preventing suicide behaviors. Depression remains to be a very important factor for suicide behaviors among medical staff.

In the current study, we also analyzed the social-demographic and work-related variables, and the results found that female, doctor degree, physical diseases are associated with a higher prevalence of lifetime and one-year suicidal ideation. The previous studies have proofed the higher prevalence of suicidal behavior among Chinese females in different populations [59, 60]. The association between physical diseases also has been identified in many studies worldwide [61]. For education, the conflicting results were found in different studies [62, 63]. Medical staffs with a higher academic degree may have more opportunities to take in charge of the works, and they are in higher level of job stress that is a risk factor for suicidal ideation [64].

There are also some limitations that we should consider when we interpret the findings. Firstly, as a cross-sectional study, we cannot infer any causal relationships among these variables analyzed in this study. Secondly, as we conducted this study under Chinese culture, it should be cautious when we extend the results into other counties with a different culture. Finally, as the sample in the current study is medical staff, results may be not consistent with other populations. Further works should be conducted to test the model fits among other populations.

Despite these limitations, the current study firstly explored the effect of work-family conflict on suicidal ideation, and we analyzed the associations among work-family conflict, social support, depression, and suicidal ideation. The results further imply the methods of suicide prevention. We should pay more attention to the work and family problems among Chinese medical staff, and depression is an important factor associated with suicidal ideation. Both of them should be scanned for identification and treatment of suicide behaviors.

Declarations

Ethics approval and consent to participate

The institutional review board of Shandong University School of Public Health approved the study protocol before data collection. Informed consent was obtained from all of the participants.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

MX analyzed the data and wrote the manuscript. LS designed this study and was a major contributor in writing the manuscript. WZ and ZG collected the data and gave important comments on this manuscript. All authors read and approved the final manuscript.

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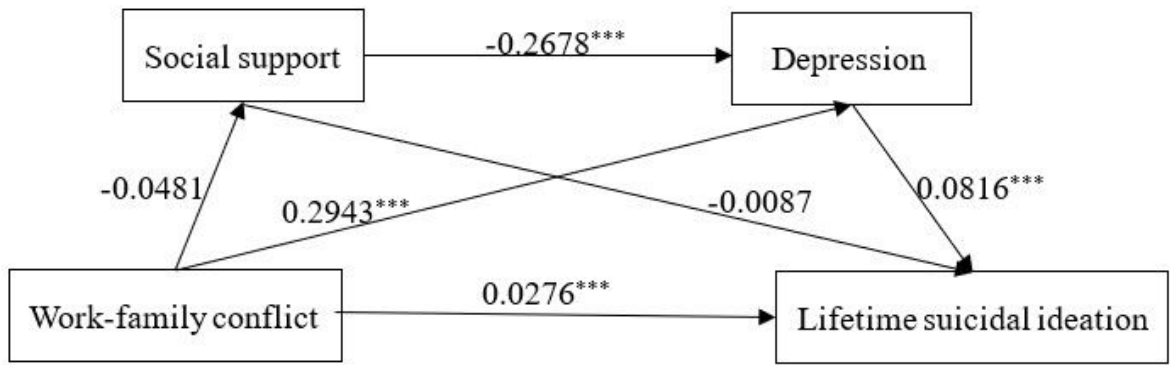
Figures

Figure 1

Conditional process analysis for the effect of work-family conflict, depression and social support on lifetime suicidal ideation among medical staffs (gender, age, married status, education and physical disease were controlled in the regression. *** means $p<0.001$.)
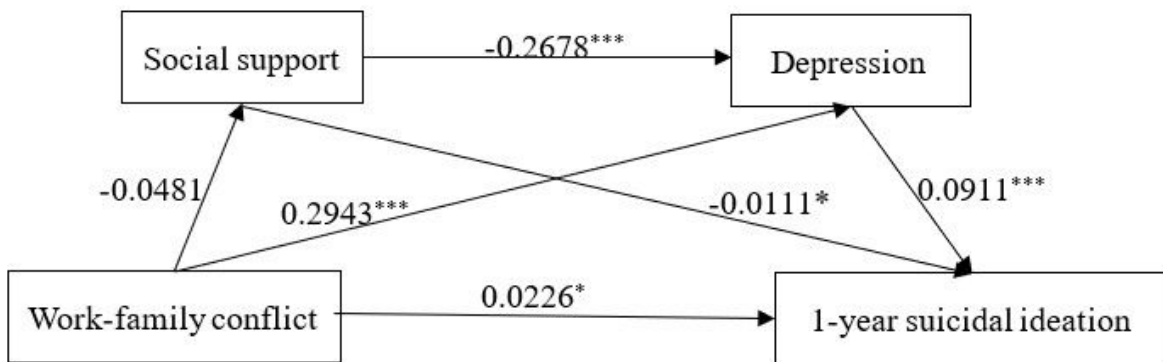

Figure 2

Conditional process analysis for the effect of work-family conflict, depression and social support on 1-year suicidal ideation among medical staffs (gender, age, married status, education and physical disease were controlled in the regression. * means $p<0.05$. *** means $p<0.001$.)