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Impact of care guilt on the health status of female medical staff: a cross-sectional study

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Abstract

Background In this study, we explored changes to female medical staff's health status under the influence of care guilt in the process of balancing work and family care responsibilities. The mediating role of time pressure within this nexus was examined, and an ideal concept derived from the Confucian cultural context, "Zhong-yong," was investigated as a moderator of the impact of care guilt on health status.

Method A questionnaire survey of 407 full-time female medical staff with family care needs, recruited using convenience sampling from eight hospitals in China, was conducted. The survey tools comprised the Relationship Guilt Scale, Dapkus' time pressure scale, Zhong-yong scale, and Self-rated health status scale. A moderated mediation model was established to test the hypotheses.

Results Care guilt had a significant negative impact on health condition after controlling for variables such as age, educational level, and professional position. Time pressure mediated the association between care guilt and health status. Zhong-yong levels moderated the effects of care guilt on time pressure and had a direct effect on health condition. Care guilt weakened health condition, partly through the experience of time pressure. However, low levels of Zhong-yong predicted a greater negative impact of care guilt on health condition.

Conclusion Female medical staff require a comprehensive approach to balancing their work and family responsibilities to mitigate their experience of guilt and poor health.

Keywords Care guilt, Time pressure, Self-rated health, Zhong-Yong, Female medical staff

Introduction

This study aims to explore the changes to female medical staff's health status under the influence of care guilt in the process of balancing work and family care responsibilities. We examine the extent to which time pressure plays a mediating role within this nexus, and whether a cultural ideal, Zhong-yong, moderates the impact of care guilt on health condition.

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Balancing paid employment with providing unpaid care is a common daily life struggle [1]. Factors such as population aging and increased female labor force participation have highlighted the issue of paid workers having additional unpaid caring roles [2, 3]. Female professionals at the frontlines of healthcare face difficulties in balancing these roles, which impact their caring, the person they care for, and their relationship within that role; this in turn affects their work productivity and care service delivery, as well as their emotional well-being [2].

Unpaid caring roles, such as caring for a parent, parent-in-law, or family members with disabilities, usually refer to providing direct care [4]. Unpaid caring roles are seen as a family responsibility, regardless of the extent of care

required, particularly for children, older adults, and the chronically ill [2]. We examine the unpaid caring roles of female medical staff by focusing on their general family care responsibility, as family care needs may shift based on health condition changes, accidents, or aging-related issues.

Globally, female workers face high care responsibilities and social expectations [5]. Fulfilling family care responsibilities has been considered means to judge their ability to balance work and family; whether an individual can manage their family care responsibilities while maintaining their work performance has been considered in preference to ability in the workplace [6]. Compared to men, female workers have more social labels such as "good mother," "good wife," and "good daughter-in-law," besides "good employee" [7]. Nevertheless, family care responsibilities are not accepted as an excuse for assuming a lower workload than other paid workers [8]. An ideal worker is portrayed as one who manages both their family and paid caregiving responsibilities well [9]. Such social expectations promote a complex definition of female employment as integrating different societal roles, which leads to women misunderstanding societal expectations as a measure of their self-ability and trying to fulfill unattainable goals [10]. If they cannot accomplish their working or caring goals, or both, female employees often develop care guilt, which is a negative, self-conscious emotion that occurs in the process of managing work–life balance [9] (See Fig. 1).

Care guilt may have a positive influence, such as encouraging the devotion of more time and energy for caregiving and caring roles than a typical worker in the labor market spends [11]. Nevertheless, long-term care guilt may negatively impact health status among workers, particularly women [12]. Poor health status is not only detrimental to work efficiency [13] but also significantly reduces the quality of family care [14]. Therefore, we assume that female medical staff with higher levels of care guilt have worse health status (Hypothesis 1).

Nevertheless, analyzing the relationship between female employees' care guilt and health status, as well as its underlying mechanisms and conditions for functioning, is a complex task that spans the research fields of management, sociology, and social welfare and is of great significance to the well-being of female workers and the care recipients in their families. However, existing research on how care guilt affects the health status of working women is limited.

In response to this gap, we examine a sample of full-time female medical staff to explore the extent to which care guilt weakens their health status, and analyze whether time pressure plays a mediating role in this association. It is assumed that female medical staff with high levels of care guilt experience the effects of having limited time to allot to work and family as time pressure. Although they may increase the time spent on family care to reduce their feelings of care guilt [15], they are unable to reduce their work timings significantly; with inadequate time to complete all responsibilities, they may be motivated to adjust their behavior to meet the needs of the care recipient [4]. Therefore, we argue that female medical staff are highly likely to invest more time in unpaid care activities, which limits their time for themselves, and they experience higher time pressure [16]. Further, care guilt can distract people emotionally, reduce their work efficiency, and make their work and care activities more cumbersome [11]. Consequently, we argue that female medical staff with higher time pressure have worse health status due to their allotting less time for physical exercise, which may impact long-term health [17, 18] and increase the likelihood of engaging in unhealthy behaviors [19–21]. Furthermore, long-term exposure to stress could weaken their immune systems [12, 22]. Therefore, as female medical staff with a high possibility of experiencing care guilt are likely to face high levels of time pressure, which in turn might weaken their health status [23], we hypothesize that time pressure mediates the relationship between care guilt and health status in female medical staff (Hypothesis 2).

Moreover, we argue that the feelings of guilt from balancing caring and working roles are rooted in cultural perspectives. An important factor is the concept of "Zhong-yong" (中庸), a culture-embedded manner of thinking in China wherein people are expected to approach their problems in multiple ways, handling personal and family comprehensively [24, 25]. It aims

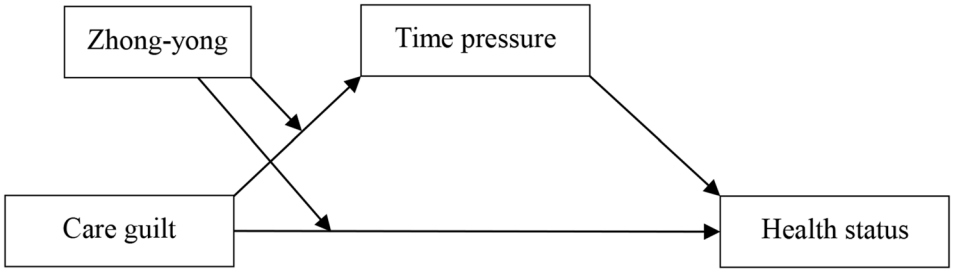

Fig. 1 Proposed theoretical model

to balance life and work, promoting harmonious family relationships by avoiding conflict physically and emotionally [26]. Zhong-yong emphasizes the idea of compromising for family members' needs, while also trying to find a dynamic balance between work and life [27]. Being kind and avoiding conflict is at the core of Zhong-yong [28, 29]. Therefore, Zhong-yong not only contributes to people's thinking but also impacts their behavior when they face difficulties in balancing family and work roles [30, 31]. Specifically, female medical staff with strong Zhong-yong tend to think about problems from multiple perspectives and have more empathy [31]. Thus, they are more likely to experience disappointment from not providing enough care for their family members, resulting in care guilt.

Further, care guilt may lead them to spend more time and energy on their family, leading to higher levels of time pressure. Therefore, they are highly likely to take on more care activities while spending more time at work, constantly reflecting on how much more they have to do to balance work and life [28, 30]. This thought and behavioral process also leads to higher time pressure. Hence, we investigate whether this ideal of Zhong-yong moderates the effect of care guilt on time pressure for female medical staff. And we hypothesize that Zhong-yong moderates the effect of care guilt on time pressure: when Zhong-yong is high, care guilt has a greater impact on time pressure; when Zhong-yong is low, care guilt has a lower impact on time pressure (Hypothesis 3a).

In addition, we argue that Zhong-yong moderates the effects of care guilt on health status in female medical staff. Because female medical staff with high Zhong-yong levels may pursue harmony and balance among their multiple aspects (work, care recipients, themselves, etc.). Even if they experience care guilt, they may try to handle the problem from multiple dimensions. From this perspective, female medical staff with high Zhong-yong are less likely to sacrifice their health to alleviate care guilt, and thus, the negative impact of care guilt on health status may be relatively weak. Female medical staff with low Zhong-yong are less adept at considering issues in a balanced manner and more likely to focus only on one aspect—either taking care of their families or themselves—which could lead to care guilt having a greater impact on work–life balance, thereby weakening their long-term health status. Therefore, we assume that Zhong-yong moderates the effect of care guilt on health status: when Zhong-yong is high, care guilt has a lower impact on health status; when Zhong-yong is low, care guilt has a greater impact on health status (Hypothesis 3b).

Based on this background, we conducted a questionnaire survey of 407 full-time female medical staff from eight hospitals in China, which included measures of care guilt, time pressure, Zhong-yong, and self-rated health status. A moderated mediation model was established to test the hypotheses. This study involved a descriptive analysis of the variables, examination of whether the data had serious common method bias, and examination of the hypotheses in a step-wise manner.

This study contributes to the literature by providing insight into the reconciling of work, caring for the family, and cultural influences in employed women in China. Its value lies in its socio-psychological perspective. Emphasizing the understanding of employment conditions, feelings of guilt, and being an unpaid carer, this study may benefit research, education, and policy.

Method

Participants and procedures

We selected female medical staff working in two cities, one each from the north (Changchun City, Jilin Province) and south (Hefei City, Anhui Province) of China, to participate in the survey. China's hospital system is divided into three levels [32]. Primary-level hospitals are mainly engaged in preventive medical care, with activities quite different from the secondary and tertiary-level hospitals, which are mainly engaged in diagnosis and diseases treatment. Consequently, medical staff in the secondary and tertiary hospitals face higher workload and work pressure [33]. Therefore, we selected participants from the secondary and tertiary hospitals in both cities through a snowballing process. We first contacted the health commission department in the two cities, and asked them to recommend one or two secondary or tertiary hospitals. Second, we contacted these hospitals and requested for their consent to administer questionnaire surveys. Third, after obtaining the consent of a hospital manager, we asked them to recommend other secondary or tertiary hospitals in the same city until we found eight hospitals and reached our requirement. The eight hospitals (four tertiary and four secondary) allowed us to conduct a questionnaire survey with their medical staff with our assurance that the data would only be used for research.

We broadcasted information for recruiting participants on the WeChat and DingTalk work groups of the eight hospitals, from May to June in 2023, with the assistance of the hospitals' human resources department. The inclusion criteria were (1) women aged 18 years or above; (2) working full-time in the hospital for the past 12 months, with average working hours per week of no less than 24; (3) practically engaged in medical work, such as doctors, nurses, and screening staff; (4) work experience of at least 2 years in either secondary or tertiary hospitals, or both; (5) having family care responsibilities, that is, caring for children under 12 years, older people over 65 years, family members with disabilities, or a combination; (6) not receiving any form of payment from the social welfare

system, government, or any organization for their care activities; and (7) willing to participate in this survey after understanding its purpose. Willing individuals received a WeChat link to the questionnaire and completed it independently on their mobile phone, laptop, or other device. After completing the questionnaire, participants received a payment of approximately US$1 as a token of appreciation. We distributed a total of 480 questionnaire links, received 431 electronic responses, and finally screened 407 valid responses after eliminating invalid data, such as trend responses, from 24 respondents.

Variables

Care guilt

A revised version of Ziadni et al.'s [34] Relationship Guilt Scale was used. Specific items included: (1) I feel a little guilty because my workload affects my caring role in the family; (2) I often feel guilty because my workload affects my caring role in the family; (3) My workload makes me lack communication with my family, and I feel somewhat miserable. Responses were indicated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Cronbach's α was 0.900. The mean of the three items was used as an indicator of care guilt; the higher the score, the higher the care guilt level.

Time pressure

The scale developed by Dapkus (1985) was used to measure the time pressure of medical staff. Specifically, the scale includes three items: (1) I feel rushed to do the things that I have to complete; (2) I do not have enough time to get everything done; (3) I often feel pressed for time. Medical staff responded on a 5-point Likert scale, with 1 representing "strongly disagree" and 5 representing "strongly agree." This scale has high reliability and validity and is often used in studies involving time pressure (e.g., Guo et al. [35]). In this study, the Cronbach α of the time pressure scale was 0.850. The mean of all items was used as an indicator of time pressure for medical staff. The higher the score, the stronger the time pressure experienced.

Zhong-Yong

We used Yip et al.'s [33] six-item Zhong-yong scale. Sample items include: (1) There is always a limitation to everything. It is not good to go over or not to reach it and (2) I can always find a compromise or balance point among different opinions. Responses were provided on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). This scale has high reliability and validity, and is frequently used in academic research [30]. The Cronbach's α was 0.916. The mean of the six items was considered an indicator of the Zhong-yong level; the higher the score, the higher the Zhong-yong level.

Self-rated health status

Referring to Lachman and Weaver [36], participants were asked to evaluate their current physical health status using a 7-point scale from 1 (worst possible state) to 7 (best possible state). Many studies have shown that self-rated health status is closely related to objective health status [37, 38], and a well-constructed single-item indicator is a relatively efficient and stable tool for measuring the health status of individuals [39, 40]. Similar to Chen and Yang [41], the higher the participants' rating, the better their health status.

Control variables

This study includes three types of control variables. First, demographic variables including age, educational level (1 = bachelor's degree and above, 0 = other) and marital status (1 = married, 0 = other). Second, work-related control variables including professional titles (1 = mid-level to senior title, 0 = other), whether they had supervisory responsibility (1 = yes, 0 = no), and hospital level (1 = tertiary hospital, 0 = other). Third was whether the participant had any chronic diseases (1 = yes, 0 = no).

Data analysis

We used SPSS version 25.0 (IBM Corp., Armonk, NY, USA) and M-plus 8.11 to analyze the data. First, a descriptive analysis of the variables was performed, and the mean, standard deviation, and correlation coefficients among the main variables were calculated. Second, we examined whether the data had serious common method bias problems. Third, we examined the hypotheses in a step-wise manner [42]. Specifically, we tested (i) the direct effect of care guilt on health status (Hypothesis 1); (ii) analyzed whether time pressure plays a mediating role in the association between care guilt and health status (Hypothesis 2); (iii) explored whether Zhong-yong moderates the impact of care guilt on the mediating variable—time pressure—and the outcome variable—health status (Hypotheses 3a and b). Before model testing, we performed mean-centered processing on the continuous variables [43]. When using bootstrapping for analyzing the mediation and moderation effects, the number of repeated samplings was set to 10,000. In the following analyses, unless otherwise specified, we included the aforementioned control variables such as age, marital status, and professional title.

Results

Descriptive statistical analysis results

The age of the 407 female medical staff included in this study ranged from 23 to 74 years, with a mean age of 38.34 years ($SD = 8.81$). Regarding respondents' educational level, 296 participants had a bachelor's degree or above (72.73%). Furthermore, 343 were married (84.28%)

and 64 were unmarried, divorced, or widowed (15.72%). Participants' average work experience was 16.09 years (*SD* = 9.57 years). Regarding professional positions, 237 participants had intermediate or senior titles, accounting for 58.23%, and 170 had junior titles (41.77%). In addition to providing medical care, 138 participants (33.91%) had administrative responsibilities.

Descriptive statistics of the independent, dependent, mediating, moderating, and control variables, including means, SDs, and correlation coefficients, are presented in Table 1. Care guilt was significantly negatively correlated with health status and positively correlated with time pressure. Time pressure was significantly negatively correlated with self-rated health status. The moderator variable, Zhong-yong, had no significant correlation with care guilt or time pressure, but was significantly positively correlated with health status.

Common method deviation test

We anticipated the risk of common method bias owing to the cross-sectional design; we used Harman's single-factor test to determine possible common differences in the data [44]. The results showed that five factors could be extracted using exploratory factor analysis, among which the factor with the largest explanation rate could only explain 21.529% of the total variance, far lower than the standard of 40% [45]. Therefore, the data did not suffer from serious common method bias.

Hypotheses testing

Before the mediation analysis, we examined the direct impact of care guilt on health status. The results showed that care guilt had a significant negative impact on health status (B = -0.300, $p < .001$), 95% confidence interval (CI) obtained by 10,000 bootstrap sampling calculations = [-0.463, -0.130]. CI did not include zero, indicating that those with higher levels of care guilt had worse health status after controlling for age, educational level, professional title, and other variables.

Based on this result, we continued to analyze whether time pressure mediated this relationship (Table 2). Care guilt had a significant positive impact on time pressure, whereas time pressure had a significant negative impact on health status. Bootstrap results showed that the 95% CI of the impact of care guilt on health status through time pressure = [-0.175, -0.032]. CI did not contain zero, indicating that time pressure played a mediating role between care guilt and health status, supporting Hypothesis 2.

Next, we explored whether Zhong-yong moderated the impact of care guilt on time pressure and physical health status (Table 3). Our analysis showed that the cross-product term of care guilt and Zhong-yong significantly affected time pressure, $B = 0.208$, $p = .014$, 95% CI

Table 1 Means, standard deviations, and correlations for the variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. CG	3.61	0.89										
2. TP	3.43	0.79	0.39***									
3. ZY	4.09	0.46	0.02	0.06								
4. Health	4.02	1.32	−0.22***	−0.22***	0.23**							
5. Age	38.34	8.81	−0.01	0.06	−0.02	0.04						
6. Edu	0.73	0.45	0.16**	0.07	−0.03	−0.07	−0.28***					
7. MS	0.84	0.36	0.05	0.09	−0.04	−0.03	0.29***	0.02				
8. PFT	0.58	0.49	0.07	0.05	−0.04	−0.03	0.38***	0.19***	0.22***			
9. SR	0.34	0.47	0.09	−0.04	0.01	−0.03	0.29***	−0.13**	0.11*	0.13**		
10. LOH	0.28	0.45	0.03	0.11*	0.03	−0.01	0.06	0.16**	−0.01	0.10	−0.11*	
11. CD	0.16	0.37	0.10	0.04	0.01	−0.10*	0.23***	−0.05	0.10	0.11*	0.06	−0.03

Note. $N = 407$; CG = Care Guilt; TP = Time pressure; ZY = Zhong-Yong; Health = Self-rated health; Edu = Educational level; MS = Marital status; PFT = Professional title; SR = Supervisory responsibility; LOH = Level of hospital; CD = Chronic disease; * $p < .05$. ** $p < .01$. *** $p < .001$

Table 2 Results of the simple mediation model

Variables	*B*	*SE*	*p*	Bootstrapped 95% CI	
				LL	*UL*
Mediator variable model: TP					
CG	0.351	0.043	< 0.001	0.266	0.437
Age	0.007	0.006	0.239	-0.004	0.018
Edu	0.008	0.096	0.935	-0.177	0.199
MS	0.142	0.113	0.212	-0.078	0.368
PFT	-0.030	0.079	0.703	-0.184	0.124
SR	-0.143	0.083	0.083	-0.310	0.016
LOH	0.152	0.085	0.075	-0.017	0.316
CD	-0.017	0.101	0.869	-0.210	0.185
Outcome variable model: Health					
CG	-0.203	0.089	0.023	-0.371	-0.022
TP	-0.275	0.103	0.007	-0.478	-0.077
Age	0.015	0.009	0.111	-0.003	0.033
Edu	-0.031	0.155	0.841	-0.337	0.279
MS	-0.055	0.174	0.752	-0.397	0.281
PFT	-0.067	0.151	0.657	-0.368	0.225
SR	-0.114	0.154	0.459	-0.421	0.188
LOH	0.010	0.151	0.948	-0.293	0.306
CD	-0.359	0.188	0.057	-0.727	0.014
CG ◊ TP ◊Health	-0.097	0.037	0.008	-0.175	-0.032

Note. *N* = 407; CG = Care Guilt; TP = Time pressure; Health = Self-rated health; Edu = Educational level; MS = Marital status; PFT = Professional title; SR = Supervisory responsibility; LOH = Level of hospital; CD = Chronic disease; CG◊ TP ◊Health = CG effect on Health through TP

Table 3 Results of the moderated mediation model

Variables	*B*	*SE*	*p*	Bootstrapped 95% CI	
				LL	*UL*
Mediator variable model: TP					
CG	0.329	0.042	< 0.001	0.249	0.411
ZY	0.100	0.092	0.276	-0.093	0.268
CG*ZY	0.208	0.085	0.014	0.031	0.365
Age	0.006	0.006	0.298	-0.005	0.017
Edu	0.010	0.095	0.917	-0.174	0.197
MS	0.130	0.113	0.250	-0.093	0.357
PFT	-0.047	0.077	0.544	-0.195	0.107
SR	-0.146	0.081	0.072	-0.310	0.009
LOH	0.146	0.084	0.084	-0.021	0.311
CD	-0.026	0.100	0.796	-0.219	0.173
Outcome variable model: Health					
CG	-0.231	0.086	0.007	-0.395	-0.057
ZY	0.436	0.137	0.001	0.163	0.702
GOC*ZY	0.381	0.173	0.028	0.055	0.728
TP	-0.321	0.096	0.001	-0.511	-0.135
Age	0.014	0.009	0.121	-0.003	0.031
Edu	-0.017	0.152	0.910	-0.313	0.288
MS	-0.058	0.168	0.729	-0.389	0.269
PFT	-0.093	0.149	0.532	-0.394	0.193
SR	-0.131	0.152	0.388	-0.436	0.168
LOH	-0.005	0.150	0.974	-0.304	0.286
CD	-0.379	0.185	0.041	-0.742	-0.021

Note. *N* = 407; CG = Care Guilt; TP = Time pressure; ZY = Zhong-Yong; Health = Self-rated health; Edu = Educational level; MS = Marital status; PFT = Professional title; SR = Supervisory responsibility; LOH = Level of hospital; CD = Chronic disease

[0.031, 0.365], indicating that Zhong-yong moderated the impact of care guilt on time pressure. To clearly present the moderating effect of Zhong-yong, we conducted simple slope analysis [46]. When Zhong-yong was at the mean level + 1 SD, care guilt had a significant impact on time pressure, $B = 0.425$, $p < .001$, 95% CI [0.305, 0.535]; when Zhong-yong was at the mean level − 1 SD, care guilt also had a significant impact on time pressure but with a smaller regression level, $B = 0.234$, $p < .001$, 95% CI [0.121, 0.340]. We then constructed an index to represent the difference in the impact of care guilt on time pressure when the Zhong-yong value was above and below the mean by 1 SD; the results show that the 95% CI of the index = [0.029, 0.335], which did not contain zero. Therefore, there was a significant difference in the impact of care guilt on time pressure under the two conditions, implying that Zhong-yong moderated the impact of care guilt on time pressure. Compared to the case wherein the Zhong-yong level was lower, when Zhong-yong was higher, the impact of care guilt on time pressure was larger, supporting Hypothesis 3a.

In addition, when Zhong-yong was at the mean + 1 SD level, the impact of care guilt on health status through time pressure was significant, B = -0.136, $p = .002$, 95% CI [-0.231, -0.061]; when Zhong-yong was at the mean − 1 SD level, the impact of care guilt on health status through time pressure was also significant, B = -0.075, $p = .011$, 95% CI [-0.148, -0.029]. We then constructed an indicator to express the difference in the moderated mediating effect of care guilt on health status through time pressure in these two situations. The 95% CI of this indicator = [-0.140, -0.014], indicating that Zhong-yong regulated the mediating effect of time pressure in the relationship between care guilt and health status. Compared to low Zhong-yong levels, when the participants had high Zhong-yong, their care guilt had a greater negative impact on health status through time pressure.

Zhong-yong also moderated the direct effect of care guilt on health status. As shown in Table 3, the cross-product term of care guilt and Zhong-yong had a significant impact on health status, $B = 0.381$, $p = .028$, 95% CI [0.055, 0.728]. Further, simple slope analysis [46] found that when the Zhong-yong level was at mean + 1 SD, the effect of care guilt on health status was not significant, B = -0.056, $p = .629$, 95% CI [-0.273, 0.169]; however, when the Zhong-yong level was at mean − 1 SD, care guilt had a significant impact on health status, B = -0.406,

$p = .001$, 95% CI [-0.647, -0.177]. Thus, Hypothesis 3b was supported.

The mechanism of the impact of Zhong-yong on care guilt in female medical staff is complex. When female medical staff had higher levels of Zhong-yong, although the direct effect of care guilt on health status was not significant, care guilt had a significant negative impact on health status through time pressure. When the participants' Zhong-yong levels were low, care guilt had a significant negative effect on health status. Although care guilt also had a significant negative effect on health status through time pressure, the impact was relatively less than when the participants had high levels of Zhong-yong. For a clearer understanding of whether Zhong-yong promotes or weakens the overall impact of care guilt on health status (including direct and mediated effects through time pressure), we again conducted simple slope analysis [46]. When Zhong-yong was high, the overall effect of care guilt on health status did not reach significance, B = -0.192, $p = .090$, 95% CI [-0.408, 0.030]; when Zhong-yong was low, care guilt had a significant negative impact on health status, B = -0.481, $p < .001$, 95% CI [-0.713, -0.260]. Therefore, Zhong-yong can weaken the negative impact of care guilt on health status.

Robustness check

We verified whether the main findings remain unchanged without the control variables [45], and found that care guilt still had a significant directly negative impact on health status, B = -0.325, $p < .001$, 95% CI = [-0.487, -0.150]. In the simple mediation effect model, the mediating effect of care guilt on health status through time pressure was still significant, B = -0.091, $p = .013$, 95% CI = [-0.170, -0.024]. In the moderated mediation model, the cross-product term of care guilt and Zhong-yong had a significant impact on time pressure, $B = 0.222$, $p = .012$, 95% CI = [0.037, 0.386] and health status, $B = 0.370$, $p = .030$, 95% CI = [0.047, 0.712]. When the participants had high Zhong-yong levels (mean + 1 SD), the overall effect of care guilt on health status was not significant (although the p-value of the coefficient was less than 0.05, the 95% CI included zero), B = -0.223, $p = .046$, 95% CI = [-0.434, 0.001]. When Zhong-yong was lower (mean − 1 SD), the overall effect of care guilt on health status (including the direct effect and the mediated effect through time pressure) reached significance, B = -0.500, $p < .001$, 95% CI = [-0.729, -0.279]. The above results are consistent with those including the control variables, indicating robustness [46].

Discussion

Theoretical implications

First, this study's value lies in the proposed mechanisms through which care guilt impacts the health status of female medical staff. Other studies have focused on the impact of emotions on caregivers, particularly paid or formal caregivers [47]. Literature argues that care guilt can cause anxiety and is a key source of internal stress. Long-term care guilt can weaken the normal functioning of the immune system of caregivers, potentially leading to poorer health outcomes [48, 49]. This study proposes that, compared to paid caregivers, unpaid working carers with full-time jobs usually lack attention from institutional policy, the public, and academic research. Exploring the mechanism of care guilt among female medical staff contributes to expanding our understanding on this persistent problem and establishing a theoretical focus on gender equality. Medical staff who experience care guilt are likely to invest more time and energy in caring roles to alleviate this feeling, from the perspective of psychological resources. This means medical staff have to sacrifice their leisure time to accommodate family care. Some women may even deliberately give up entertainment because they believe that such activities are incompatible with the ideal caregiver image, or because they might feel guilty if they are unable to achieve self-satisfaction in caring for their family as well as working.

Second, this study contributes a socio-psychological perspective via a conceptual analysis of care guilt, gender, and the notion of Zhong-yong. Care guilt relates to internal expectations of oneself and is impacted by culture, society, gender, and public power, and exacerbated by gender norms. Other studies argue that Zhong-yong is a way of thinking rooted in China's Confucian culture [27] and still exerts an important influence on social behaviors [50]. Zhong-yong aims to balance life and work, promoting a harmonious family life by avoiding physical and emotional conflict; encouraging thinking from multiple perspectives; and recommending the use of various strategies to balance the needs of others and oneself [24, 26]. Improved interpersonal skills and expressing opinions tactfully to avoid conflicts are important standards to assess the implementation of Zhong-yong [51]. As a way of thinking formulated in traditional China, Zhong-yong has long been regarded as having a profound impact on the people and promoting positive social behavior [e.g., 27,50].

However, Zhong-yong may not always lead to good results. This study extends the research on this notion, hypothesizing that Zhong-yong may exacerbate some negative outcomes, such as stimulating female medical staff to experience higher time pressure and care guilt, thereby contributing to a more comprehensive understanding of the role of cultural context. It considers the cultural influence of Confucian views of caring for family members in the familial system under the Zhong-yong concept.

Third, this study provides insight into the reconciling of work and family roles, and cultural influences in employment. The perception of care guilt relates clearly to an inability to provide care for the family to the desired extent, and working mothers, wives, or daughters are often tasked with heavy family care responsibility, which causes exhausted female medical staff to experience care guilt [48]. Care theories typically seek to address the way in which care is integrated as a connected or sequenced concept, to understand ways in which each facet of care is linked to others, and to reduce care inequality for men and women [52, 53]. While caring *about* is a necessary step in the current society, common to men and women, men's caring is typically confined to taking care responsibility [54, 55], whereas female caregivers, and other oppressed and socially undervalued groups, are assigned responsibility for providing care [4, 56]. The focus on women's caring is indicative of the direction that care theory must develop in the next decade [2, 4]. Rather than demanding that women adopt the values of responsibility for care as a burden holding them back, the ethical approach acknowledges the importance of care as part of the recognition of women's rights [57, 58].

To extend care theory research, we propose that the impact of care guilt on the health status of female employees with high workloads is, in principle, connected to their perception of "letting down" employers, colleagues, family members, and the public. Although realizing that they are themselves suffering because of work–life conflicts, they feel trapped in the ideal course of "heroism," which could lead to guilt from a perceived failure to balance caring and working roles, as well as family needs and their own. We argue that female medical staff are burdening themselves with additional work, normalized as being a "part of responsibility." Therefore, it is necessary to instill that "it is not necessary to be perfect" in the academic perspective and prove that pressure from the family, colleagues, friends, and employers toward gendered expectations and social stigma have a negative impact on female full-time workers' well-being and happiness.

Practical implications

Practical and policy-level changes could be implemented to combat the prevalence of care guilt, and facilitate its management, among female medical staff. First, the literature proposes rising from the identification of unrecognized and unpaid domestic duties imposed on women as a result of the gendered division of household and familial labor, to the significance of the different roles and relationships associated with the responsibility of providing care [4, 59]. Men have been seen as taking responsibility for caring *about* someone, but women overwhelmingly (but not exclusively) have the responsibility for caring *for* someone [60, 61]. Compared with the literature [62], we found that increasing female medical staff's participation in caregiving is not enough to improve their quality of life, and more support is needed from other resources, whether formal or informal. To ensure female medical staff's overall well-being, state interventions should not only include "mother-friendly" welfare and labor policies but also ensure that mothers engage in healthy behaviors and obtain better living conditions. Greater emphasis should be placed on the participation of fathers in caring, to balance unpaid family care responsibilities at the institutional or family level. A family support system integrating community care for older persons, children, and mothers targets the whole family's needs instead of separating mothers and fathers or genders; policies implementing such systems are necessary in China and other countries.

Second, an additional resource that could alleviate female medical staff's care guilt and social stigma around care provision is equality legislation. Considering existing literature that considers family care to be a moral value comparable with justice [63], as well as studies on assessing its true value in a market society given the problems associated with assigning it an economic value [2, 4], we believe that the concept of family caregivers could be included in legislation as a protective feature to support carers with legal resources to either offer additional care services to the family through the workplace (in addition to flexible working hours) or to support family care through the community. Afterall, care is work and physical activity, and a form of labor, which involves tending to the needs of another [64–66]. Working employees with family care responsibilities should have a right to ask for leave within reasonable conditions, and the policy system should set up a fair assessment to determine entitlement to such care leave.

Third, it is evident that the pressure of care for the family is placed primarily on women. Adjusting social views on integrated care responsibilities to match those of workload, and examining the impact of care guilt on both work productivity and career development is necessary. Previous studies report that Zhong-yong encourages people to think about issues more comprehensively [26, 27], such that they focus on both short and long-term gains and losses when making decisions. Zhong-yong leads people to be concerned not only about their family members and work situations but also about their own well-being [50, 67]. It increases their chances of realizing that better health status is a fundamental condition for better work productivity and resources for caring for their families, thus mitigating the impact of care guilt on health status. In other words, Zhong-yong pushes people to balance multiple goals [68]. Based on the previous literature, we further proposed that using the influence of

Confucianism to release assumptions and beliefs surrounding the "caring gender" ideology may be effective. Unpacking the inequalities in caring roles of full-time workers in the aging society should include tackling structural bias and public presupposition on "who should provide care services," "how women need to behave in society," and "on what level family care needs should be fulfilled."

Limitations

This study has certain limitations that need to be addressed. First, the data were cross-sectional, and the results cannot provide direct evidence of causality [69]. Follow-up studies using a longitudinal design are required. Second, there may be multiple underlying mechanisms in the nexus between care guilt and female medical staff's health status; we only examined whether time pressure plays an important role. Future research could include larger impact factors and explore more complex mechanisms. Third, we only examined whether Zhong-yong, and no other variables, plays a moderating role in the relationship between care guilt and health status. Fourth, we used data collected from eight Chinese hospitals whose female medical staff have family members with care needs based on convenient sampling. Future research can expand the sampling scope, and use more rigorous techniques and multi-item measurements or objective indicators. Owing to cultural differences, the results need to be cautiously generalized to other countries. The care guilt and care behaviors of different social groups and cultural contexts should be examined in the future.

Conclusion

In this study, we explore contemporary developments in women's care feeling, focusing particularly on female medical staff's health status as a case study exemplifying the balance of work and family care responsibilities embedded in the phenomenon of care guilt. We focused on the extent to which time pressure plays a mediating role within this nexus, and whether a cultural ideal, Zhong-yong, moderates the impact of care guilt on health condition. Our findings highlight that female medical staff who experience high levels of care guilt also experience high time pressure, which leads to worsening health status. Zhong-yong weakened the negative effects of care guilt on the health status of female medical staff; however, Zhong-yong also increased the negative effects of care guilt on time pressure. Alongside the empirical insights into the experiences of workers, our study contributes to theory by showing how, at the nexus of family and work, guilt constitutes an important psychological aspect that influences health status, and which explains the susceptibility of female workers with high workload to time pressures. We thus extend the association between care guilt and health status in female medical workers.

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Author contributions

Conceptualization: CX and JX; Funding acquisition: JX; Formal analysis: CX and JX; Methodology: CX; Writing - review & editing: JX; Data curation: CX; Project administration: JX. All authors have read and approved the final version of the manuscript.

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Data availability

The datasets generated and/or analyzed during the current study are not publicly available. The anonymized data can be obtained from two sources. First, access to the anonymized data is available from the government, which provided financial support for the current study. Second, the anonymized data are available from the corresponding author upon reasonable request, subject to permission from the School of Marxism, Anhui Normal University in China.

Declarations

Ethical approval and consent to participate

This study was approved by the ethics committee of Anhui Normal University (approval number: AHNU-ET2023127), and was conducted with the participants' understanding and consent in accordance with the Declaration of Helsinki (1964).

Competing interests

The authors declare no competing interests.

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