

Analysis of the potential dimensions of guilt feelings among family caregivers of elderly patients with multiple chronic conditions and their influencing factors

Xiaojie Ma^{1,a}, Ruihan Wu^{2,b}, Gaohua Wang^{3,c*}, Lili Zhang^{4,d*}, Xiangying Shen^{1,e}, Jiaojiao Wu^{1,f}, Zhen Luo^{1,g}, Xinmei Wang^{5,h}, Doudou Lin^{1,i}

¹ Department of Geriatrics, Renmin Hospital of Wuhan University, Wuhan 430060, Hubei, China

² Nursing Department, Renmin Hospital of Wuhan University, Wuhan 430060, Hubei, China

³ Department of Psychiatry, Renmin Hospital of Wuhan University, Institute of Neuropsychiatry, Renmin Hospital of Wuhan University, Wuhan 430060, Hubei, China

⁴ Cadre Health Department, Renmin Hospital of Wuhan University, Wuhan 430060, Hubei, China

⁵ Department of General Practice, Renmin Hospital of Wuhan University, Wuhan 430060, Hubei, China

aEmail: 675483629@qq.com bEmail: 1661314805@qq.com cEmail: wgh6402@whu.edu.cn d Email: zhanglili_11zll@163.com

eEmail: 867235706@qq.com fEmail: 1551389139@qq.com gEmail: 583453197@qq.com hEmail: 654723508@qq.com

iEmail: 676908672@qq.com

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Abstract: Elderly patients with multiple chronic diseases are individuals in the elderly population who suffer from various chronic conditions simultaneously. This situation not only affects their quality of life but also imposes a significant economic burden on their families and society. Given the psychological stress that family caregivers may experience during the caregiving process, this study aims to explore the heterogeneity of guilt feelings among family caregivers of elderly patients with multiple chronic diseases and its influencing factors. Using a cross-sectional survey design planned from June 2024 to June 2025, Family caregivers of elderly patients with multiple chronic diseases undergoing treatment at a third-class hospital in Wuhan will be selected to evaluate their feelings of guilt using standardized scales. Latent profile analysis (LPA) will be employed to identify potential subgroups with different levels of guilt feelings, and multiple logistic regression analysis will be conducted to explore the influencing factors. The results are expected to indicate that family caregivers' guilt feelings can be classified into three typical latent profiles, which are significantly associated with the number of coexisting diseases in patients, self-regulation ability, family caregiving attitude, and post-traumatic stress reaction. Specifically, a greater number of coexisting diseases, shorter caregiving duration, and a stronger impact of traumatic events are associated with more pronounced caregivers' guilt feelings; whereas stronger family support, greater resistance to self-regulation fatigue, and higher self-differentiation levels result in lower guilt feelings among caregivers. These findings underscore the importance of strengthening family support

and enhancing caregivers' self-regulation ability, revealing the heterogeneity of guilt feelings among family caregivers of elderly patients with multiple chronic diseases and providing a basis for future targeted psychological interventions. Therefore, future research should integrate clinical and psychosocial resources to improve the quality of care and develop strategies to enhance family well-being.

Introduction

Elderly patients with multiple chronic diseases have two or more chronic conditions simultaneously, including but not limited to cardiovascular diseases, diabetes, and cognitive impairment(Arkansan KS et al,2024). The existence of these chronic diseases not only significantly reduces the quality of life of patients but also imposes a huge financial burden on families and society. According to statistics, the medical expenses of elderly patients with multiple chronic diseases are significantly higher than those with only a single disease, and they require more caregiving resources, which causes serious pressure on family members, especially the psychological and physical health of family caregivers(Cox IA et al,2023). Currently, the treatment methods for elderly patients with multiple chronic diseases include drug therapy, rehabilitation care, and psychological support. However, due to the complex nature of multiple diseases in elderly patients, these methods often lack integration and personalization during implementation(Sánchez-Dávila JN et al,2024). Therefore, a deep exploration of the psychological state of family caregivers, especially feelings of guilt, can help improve caregiving effectiveness and patient quality of life.

Caregiver guilt refers to the moral distress and self-blame emotions that family caregivers experience when they are unable to meet the often idealized care standards set by themselves or others and when they focus on their own needs under long-term, high-intensity care pressure(Prunty MM et al,2019). Existing research has shown that caregiver guilt is closely related to care quality, caregiver psychological health, and patient quality of life. This guilt may stem from dissatisfaction with care outcomes, doubts about one's own abilities, and a sense of responsibility for the patient's condition(Campos-Sánchez M et al,2025). Research indicates that caregiver guilt not only affects their psychological health but may also impact care quality, thereby influencing the overall health status of the patient(Bashorum L et al,2022).

In recent years, research on the guilt of family caregivers has gradually increased. Studies have shown that caregiver guilt is closely related to factors such as the number of patient comorbidities, self-regulation, and family support(Mohamed Hussin NA et al,2023). In addition, lack of family support is considered one of the important factors exacerbating caregiver guilt. Compared to caregivers with good family support, those lacking support face greater difficulties in emotion regulation and self-awareness, which in turn affect their mental health(Yıldız

M et al,2010). Despite some research on caregiver guilt, exploration of its heterogeneity remains limited, especially regarding the diversity of caregiver guilt expression and influencing factors in different backgrounds (Ho AHY et al,2021). Therefore, this study aims to explore the heterogeneity of guilt among family caregivers of elderly patients with comorbidities and its influencing factors through a cross-sectional survey design. The study will use standardized scales to assess the guilt of caregivers and identify different guilt characteristics of caregivers through latent profile analysis (LPA), thereby revealing the diversity of guilt among family caregivers of elderly patients with comorbidities and exploring its influencing factors. This research not only helps to enrich the existing literature but also provides an empirical basis for developing more targeted psychological interventions for family caregivers, offering new ideas for improving the psychological health level of family caregivers and enhancing the overall care quality for elderly patients with comorbidities.

Methods

Research design and sample description

This study employed a cross-sectional survey to assess the sense of guilt experienced by primary family caregivers of elderly patients with multiple chronic diseases. The survey included family caregivers of elderly individuals aged 60 years or older with two or more chronic conditions who were treated at a third-class hospital in Wuhan between June 2024 and June 2025. The caregivers were required to possess basic literacy skills, independently complete the questionnaire, dedicate at least four hours daily to caregiving, be over 18 years of age, effectively communicate in Chinese, participate voluntarily in the study, and provide signed informed consent. Caregivers were excluded if they had severe mental illnesses or cognitive impairments that hindered their ability to complete the questionnaire, were involved in other similar intervention studies, or were responsible for the care of multiple elderly patients. The study was designed to conduct multivariable regression analysis with 22 independent variables. According to the Kendall sample size calculation method, the required sample size was 10 to 20 times the number of independent variables. After accounting for a 20% attrition rate, this suggested a sample size of 264 to 428 participants. Additionally, considering the requirements for a latent profile study—a statistical method used to identify subgroups within a population—the sample size needed to be at least 300 cases. Therefore, the final sample size was set at 480 cases.

Measurements

Basic Information Survey

Researcher-developed patient demographics were used directly to describe sample characteristics and group analysis. Specifically, the demographic charac-

teristics of the research subjects included age, gender, marital status, educational level, and caregiving-related information, such as relationship with patients and self-perceived physical condition. These demographic characteristics comprised a total of 22 structured items.

Caregiver guilt

Caregivers' guilt is evaluated through the Caregivers' Guilt Questionnaire (CGQ), which was developed by Losada et al (Pfutzenreuter KC et al,2024). It is used to assess the level of guilt in family caregivers. The questionnaire contains 22 items across five dimensions: guilt toward care recipients, guilt over neglecting family members, guilt for negative emotions, guilt for not effectively dealing with caregiving challenges, and self-care guilt. It uses a Likert scale ranging from 0 (none) to 4 (very strong), with a total score ranging from 0 to 88. A higher total score indicates a stronger sense of guilt. The scale has a Cronbach's alpha of 0.953 and is suitable for Chinese family caregivers.

Family Care Level

Family care was evaluated by the Family Care Assessment Scale (APGAR), developed by Smilkstein et al (Mayorga-Muñoz C et al,2019). The scale is used to quickly assess family functioning and consists of five items (adaptation, partnership, growth, affection, and resolve), each rated on a three-point Likert scale (0= rarely, 1=sometimes, 2=often). The total score ranges from 0 to 10, with higher scores indicating greater levels of family support for the patient. In this study, the scale demonstrated good internal consistency reliability (Cronbach's $\alpha=0.86$).

Traumatic Events Impact

Traumatic events are assessed using the Impact of Event Scale-Revised (IES-R), developed by Weiss et al (Hunt N, Evans D,2004). This scale evaluates the psychological impact of traumatic events through three subscales: intrusive thoughts (8 items), avoidance behaviors (8 items), and hyperarousal (6 items), totaling 22 items. Item scores are rated on a 5-point Likert scale (0=never, 4 = extremely severe). The total score ranges from 0 to 88, with higher scores indicating a greater psychological impact of traumatic events. The Cronbach's α of the scale in this study was 0.90, indicating good reliability.

Self-regulation of fatigue ability

Self-regulation fatigue is evaluated using the Self-Regulation Fatigue Scale (SRF-S). This scale was developed by Nes L et al (Solberg Nes L et al,2013). It is used to assess the level of self-regulation fatigue in individuals under long-term stress. Specifically, the Chinese version includes cognitive (6 items), behavioral (5 items), and emotional (5 items) components. The scale uses a Likert scale from 1 to 5 (1 = strongly disagree; 5 = strongly agree), with a total score ranging from 16 to 80, based on 16 items. Higher scores indicate higher levels of

self-regulation fatigue in patients. In this study, the Cronbach's α coefficient of the scale was 0.84; the test-retest reliability coefficient was 0.73, indicating good reliability and validity.

Level of self-differentiation

The level of self-differentiation is evaluated using the Level of Differentiation Scale (LDSS) developed by Sheikh F et al (Sheikh F et al,2013) . This scale assesses the balance between individual emotional autonomy and interpersonal fusion and comprises four dimensions: emotional reactivity, emotional cutoff, individuality, and interpersonal relationship fusion, with a total of 24 items. Each item is rated on a 4-point Likert scale (1: strongly disagree, 4: strongly agree), yielding a total score ranging from 24 to 96. A higher score indicates a greater level of self-differentiation, reflecting better emotional balance and autonomy. In this study, the scale demonstrated good reliability, with a Cronbach's α of 0.85, which is considered acceptable for internal consistency.

Survey

After unified training of the investigators on the survey procedures and questionnaire administration, they explained the research objectives to caregivers and guided them in completing the standardized questionnaire. The questionnaire was completed online through the Wen Juan Xing platform, with all questions set as mandatory. After collecting the questionnaires, invalid responses were screened out based on consistent response patterns. A total of 480 questionnaires were distributed for this survey, and 453 valid questionnaires were finally collected, with an effective recovery rate of 94.37%.

Statistical Analysis

This study used Microsoft Excel software for data entry and version 24.0 of SPSS software for statistical analysis. For quantitative data that followed a normal or approximately normal distribution, mean $\pm$ standard deviation was used for data description, and analysis of variance (ANOVA) was used for statistical comparison between groups. Qualitative data were described using frequency and proportion, and the chi-square test was used for statistical comparison between groups. Logistic regression analysis was used to explore predictive variables related to the potential categories of guilt. The significance level was set at $\alpha = 0.05$. For further latent profile analysis, this study utilized Mplus 8.3 software, with Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and Adjusted Bayesian Information Criterion (aBIC) used as the main indicators for model fit evaluation, where lower AIC, BIC, and aBIC values indicate better model fit. Classification accuracy was evaluated using information entropy, where a value closer to 1 indicates more accurate classification. Additionally, the Lo-Mendell-Rubin (LMR) adjusted likelihood ratio test and the Bootstrap likelihood ratio test (BLRT) were used to assess differences in fit among latent profile models, with a p-value less than 0.05 for both LMR and BLRT indicating that the

k-th model provides a significantly better fit than the (k-1)-th model.

Results

Feelings of guilt among family caregivers of elderly patients with comorbidities

The total score of feelings of guilt in family caregivers of elderly patients with comorbidity was (25.36±3.23) points. This total comprised several dimensions: the score for the dimension of feeling guilty about having done something wrong to the care recipient was (6.26±0.26) points; the score for feeling guilty about neglecting other family members was (2.58±0.35) points; the score for feeling negative towards others was (4.36±0.45) points; the score for feeling guilty about not coping with caregiving challenges was (8.07±1.36) points; and the score for the self-care guilt dimension was (4.12±0.78) points.

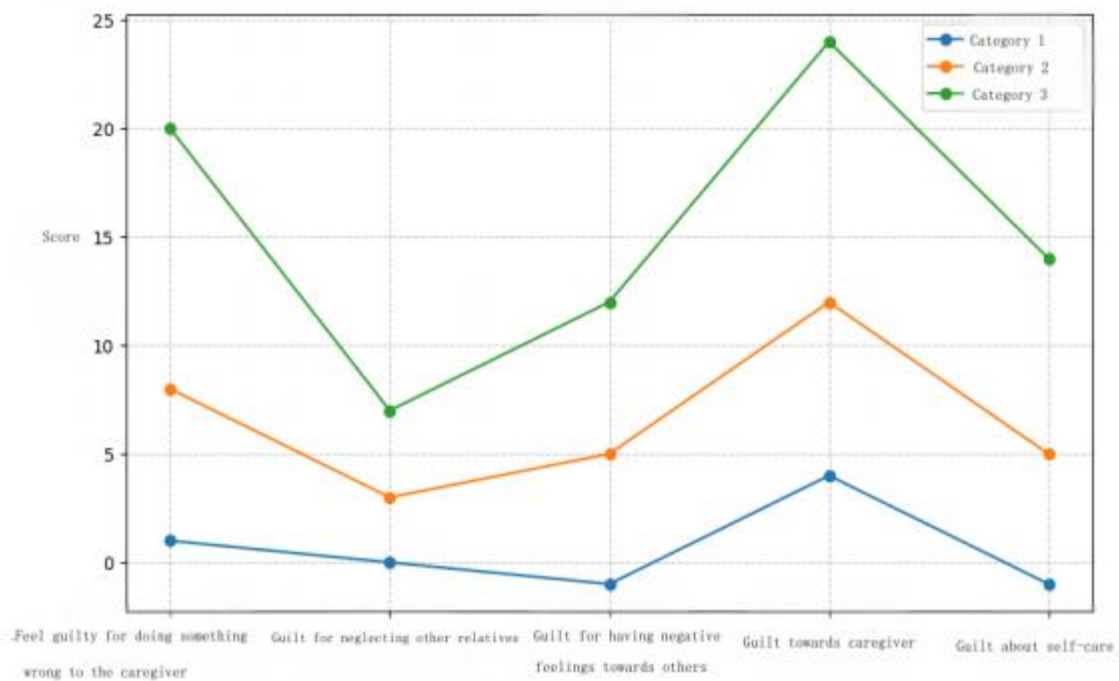
Latent Profile Analysis of Guilt Feelings in Family Caregivers of Elderly Patients with Comorbidities

Based on the standardization of the five dimensions of the Guilt Feelings in Caregivers Scale, the results of the latent profile analysis indicated that the model with three latent categories exhibited the best fit (see Table 1 for details). Consequently, the scores for each dimension in Category 1 were significantly lower than those of the other groups, indicating the lowest overall level of guilt; this group was designated as the mild guilt-positive adaptation group (n=107, 23.62%). The scores for each dimension in Category 2 were at intermediate levels, with guilt feelings in the “negative feelings of others” and “neglect of self-care” dimensions being particularly pronounced. This type of caregiver attributed guilt to the interaction between themselves and others, experiencing significant psychological conflict; therefore, it was named the moderate guilt-attribution conflict group (n=198, 43.71%). The scores for each dimension in Category 3 were the highest, with guilt feelings in the “difficulties coping with multi-disease care” dimension being especially prominent; thus, it was named the severe guilt-coping difficulties group (n=148, 32.67%). The distribution of the characteristics of the latent categories of guilt feelings in family caregivers of elderly patients with comorbidities is depicted in **Figure 1**.

Table 1. Potential Profile Fitting Index of Guilt: Among Family Caregivers of Elderly Patients with Comorbidities (n=453)

Model	AIC	BIC	aBIC	P-value		Entropy	Category Proportion (%)
				LMR	BLRT		
1	1575.02	1520.07	1505.08	-	-	-	-
2	1350.25	1380.50	1360.25	0.001	<0.001	0.752	0.567/0.438
3	1250.75	1302.34	1276.52	0.012	<0.001	0.823	0.297/0.435/0.299
4	1255.80	1328.70	1296.80	0.250	<0.001	0.782	0.347/0.288/0.312/0.026
5	1260.50	1354.70	1316.70	0.300	<0.001	0.762	0.296/0.062/0.323/0.296/0.025

Figure 1. Analysis of the Potential Characteristics of Guilt Profiles among Family Caregivers of Elderly Patients with Multiple Chronic Conditions



Potential results of univariate analysis on guilt among family caregivers of elderly patients with comorbidities

Single-factor analysis showed that there were statistically significant differences among patients in three latent categories of guilt with respect to residence; type of illness; caregivers' age; marital status; cultural background; occupation; physical condition; understanding of the disease; income; family care level; post-traumatic stress symptoms; ability to self-regulate fatigue; and level of self-differentiation ($P < 0.05$) (Table 2).

Table 2. Univariate analysis results of potential profiles of guilt feelings in family caregivers of elderly patients with comorbidities [$\pm$ s, n (%)]

Related Factors	Mild guilt-positive adaptation group (n=107)	Moderate guilt-attribution conflict group (n=198)	Severe guilt-coping difficulty group (n=148)	F/ χ^2 value	P value
Patient Gender					
Male	52 (48.60)	98 (49.49)	75 (50.68)	0.11	0.95
Female	55 (51.40)	100 (50.51)	73 (49.32)		
Patient Age					
60-69 years	33 (30.84)	65 (32.83)	52 (35.14)	0.84	0.93
70-79 years	34 (31.78)	63 (31.82)	48 (32.43)		
≥ 80 years	40 (37.38)	70 (35.35)	48 (32.43)		
Patient Residence					
Urban	75 (70.09)	138 (69.70)	46 (31.08)	61.13	<0.01
Rural	32 (29.91)	60 (30.30)	102 (68.92)		
Patient Occupation					

Worker	16 (14.95)	34 (17.17)	22 (14.86)		
Farmer	20 (18.69)	30 (15.15)	23 (15.54)		
Intellectual	18 (16.82)	38 (19.19)	24 (16.22)		
Retired cadre	18 (16.82)	30 (15.15)	24 (16.22)	10.50	0.01
Businessman	14 (13.08)	29 (14.65)	25 (16.89)		
Other	21 (19.63)	37 (18.69)	30 (20.27)		
Marital Status					
Married	67 (62.62)	115 (58.08)	102 (68.92)	10.24	0.01
Unmarried	40 (37.38)	84 (42.42)	46 (31.08)		
Number of Children					
0	15 (14.02)	18 (9.09)	10 (6.76)		
1	60 (56.07)	75 (37.88)	72 (48.65)	18.75	<0.01
≥2	32 (29.91)	105 (53.03)	66 (44.59)		
Educational Level					
Primary school and below	38 (35.51)	58 (29.29)	42 (23.38)		
Junior high school	32 (29.91)	72 (36.36)	62 (41.89)		
Associate degree and above	37 (34.58)	68 (34.34)	44 (29.73)	6.20	0.18
Income					
<3000 RMB/month	32 (29.91)	48 (24.24)	45 (30.41)		
3000-5000 RMB/month	48 (44.83)	92 (46.46)	55 (37.16)	8.15	0.09
>5000 RMB	27 (25.23)	58 (29.29)	48 (32.43)		
Payment Method					
Medical insurance	30 (28.04)	62 (31.31)	48 (32.43)		
NCMS (New Rural Cooperative Medical Scheme)	53 (49.53)	70 (35.35)	50 (33.78)		
Commercial insurance	10 (9.35)	42 (21.21)	28 (18.92)	24.36	<0.01
Other	2 (1.87)	14 (7.07)	12 (6.11)		
Self-pay	12 (11.21)	10 (5.05)	10 (6.76)		
Number of Comorbidities					
2	51 (47.66)	52 (26.26)	32 (21.62)		
3	29 (27.10)	78 (39.39)	38 (25.68)	42.18	<0.01
4	20 (18.69)	55 (27.78)	50 (33.78)		
≥5	7 (6.54)	13 (6.57)	28 (18.92)		
Caregiver Gender					
Male	57 (53.27)	96 (48.48)	68 (45.95)	1.85	0.40
Female	50 (46.73)	102 (51.52)	80 (54.05)		
Caregiver Age					
≤44 years	34 (31.78)	40 (20.20)	26 (17.57)		
45-59 years	33 (30.84)	62 (31.31)	34 (22.97)	16.89	<0.01
≥60 years	40 (37.38)	96 (48.48)	88 (59.46)		
Relationship Between Caregiver and Patient					
Spouse	42 (39.25)	80 (40.40)	52 (35.14)		
Children	50 (46.73)	88 (44.44)	80 (54.05)	8.45	0.08
Siblings	10 (9.35)	30 (15.15)	26 (17.57)		
Caregiver Marital Status					
Single	30 (28.04)	58 (29.29)	78 (52.70)		
Married	35 (32.71)	55 (27.78)	32 (21.62)	52.63	<0.01
Divorced	30 (28.04)	43 (21.72)	10 (6.76)		
Widowed	12 (11.21)	42 (21.21)	28 (18.92)		
Caregiver Education					
Primary school and below	18 (16.82)	42 (21.21)	60 (40.54)		
Junior high school	32 (29.91)	58 (29.29)	52 (35.14)	42.50	<0.01
High school or technical school	30 (28.04)	58 (29.29)	26 (17.57)		
College and above	27 (25.23)	40 (20.20)	10 (6.76)		

Caregiver Occupation					
Worker	10 (9.35)	80 (40.40)	60 (40.54)		
Farmer	30 (28.04)	64 (32.22)	52 (35.14)		
Individual	40 (37.38)	30 (15.15)	12 (8.11)		
Staff/employee of institution	20 (18.69)	12 (6.06)	10 (6.76)	100.25	<0.01
Retiree	10 (9.35)	10 (5.05)	10 (6.76)		
Other	7 (6.54)	2 (1.01)	4 (2.70)		
Caregiver Residence					
Urban	80 (74.77)	96 (48.48)	58 (39.19)	47.22	<0.01
Rural	27 (25.23)	102 (51.52)	90 (60.81)		
Live together					
Yes	67 (62.62)	112 (56.57)	85 (57.43)	1.20	0.55
No	40 (37.38)	86 (43.43)	63 (42.57)		
Physical Condition					
Good	75 (70.09)	65 (32.83)	40 (27.03)		
Fair	22 (20.56)	80 (40.40)	40 (27.03)	78.15	<0.01
Poor	10 (9.35)	53 (36.77)	68 (45.95)		
Knowledge of Illness					
Not aware	0 (0.00)	1 (0.51)	7 (4.73)		
Partially aware	12 (11.21)	142 (71.72)	98 (66.22)	120.60	<0.01
Fully aware	95 (88.79)	55 (27.78)	43 (29.05)		
Income					
<3000 RMB/month	28 (26.17)	48 (24.24)	72 (48.65)		
3000-5000 RMB/month	32 (29.91)	98 (49.49)	56 (37.84)	42.10	<0.01
>5000 RMB/month	47 (43.93)	52 (26.26)	20 (13.51)		
Family Care Level Score (points)	7.45±1.29	6.02±1.13	5.11±1.20	119.83	<0.01
Trauma Event Impact Score (points)	32.98±3.56	45.25±5.23	56.88±4.89	625.42	<0.01
Self-regulation Fatigue Ability Score (points)	42.25±4.02	55.25±3.78	64.22±4.33	835.76	<0.01
Self-differentiation Level Score (points)	48.96±3.98	62.22±4.36	75.10±4.87	112.50	<0.01

Results of Multifactorial Analysis of Guilt Feelings in Family Caregivers of Elderly Patients with Comorbidities

Using latent profiles identified through latent profile analysis as the dependent variable, logistic regression analysis was conducted with variables that showed statistically significant differences in univariate analysis as independent variables. The specific coding of independent variables is detailed (Table 3). The analysis results indicated that the number of comorbidities, self-regulation ability, whether caregiving was provided by family members, and post-traumatic stress symptoms were factors influencing caregiver guilt across different patient latent profiles, with statistical significance ($P<0.05$) (Table 4).

Table 3.Assignment Methods for Independent Variables in Experimental Design

Independent variable	Assignment method
Patient's place of residence	Urban=1, Rural=2
Patient's occupation	Worker=1, Farmer=2, Intellectual=3, Retired cadre=4, Businessman=5, Other=6
Marital status	No spouse=0, Spouse=1
Number of children	0=0, 1=1, ≥2=2
Payment method	Medical insurance=1, New rural cooperative medical care=2, Commercial insurance=3, Other=4, Self-payment=5
Age of caregiver (years)	≤44=1, 45~59=2, ≥60=3
Caregiver's marital status	Single=1, Married=2, Divorced=3, Widowed=4
Caregiver's education	Primary school or below=1, Junior high school=2, Senior high school or technical secondary school=3, College and above=4
Caregiver's occupation	Worker=1, Farmer=2, Individual=3, State-owned enterprise/institution employee=4, Retiree=5, Other=6
Caregiver's place of residence	Urban=1, Rural=2
Caregiver's physical condition	Good=1, Fair=2, Poor=3
Caregiver's understanding of the patient's disease	Unaware=1, Partially aware=2, Fully aware=3
Caregiver's income (RMB/month)	<3000=1, 3000~5000=2, >5000=3
Number of comorbidities of the patient (types)	2=1, 3=2, 4=3, ≥5=4
Self-regulation ability	Original value input
Family care degree	Original value input
Traumatic stress response	Original value input

Table 4. Multifactorial analysis of potential profiles of guilt in family caregivers of elderly patients with comorbidity

Comparison Group	Influencing Factors	Regression Coefficient (B)	Standard Error (SE)	Wald χ^2 Value	P Value	OR Value	95% CI
C1 vs C2 (with C1 as the reference group)							
	Number of patient comorbidities	0.35	0.08	19.14	<0.001	1.42	1.21~1.66
	Caregiver self-regulation ability	-0.42	0.09	21.78	<0.001	0.66	0.55~0.79
	Family caregiving level	-0.30	0.07	18.37	<0.001	0.74	0.65~0.85
	Post-traumatic stress response	0.48	0.10	23.04	<0.001	1.62	1.33~1.97
C1 vs C3 (with C1 as the reference group)							
	Number of patient comorbidities	0.62	0.10	38.44	<0.001	1.86	1.53~2.26
	Caregiver self-regulation ability	-0.78	0.12	42.25	<0.001	0.46	0.36~0.58
	Family caregiving level	-0.55	0.09	37.22	<0.001	0.58	0.49~0.69
	Post-traumatic stress response	0.85	0.12	50.06	<0.001	2.34	1.84~2.97
C2 vs C3 (with C2 as the reference group)							
	Number of patient comorbidities	0.27	0.09	9.00	0.003	1.31	1.10~1.56
	Caregiver self-regulation ability	-0.36	0.10	12.96	<0.001	0.70	0.58~0.85
	Family caregiving level	-0.25	0.08	9.77	0.002	0.78	0.67~0.91
	Post-traumatic stress response	0.37	0.11	11.33	0.001	1.45	1.17~1.80

Note: C1 is mild guilt-positive adaptation group, C2 is moderate guilt-attribution conflict group; C3 is severe guilt-coping difficulties group

Discussion

The purpose of the current study is to describe how family caregivers experience feelings of guilt while caring for elderly patients with multiple chronic conditions, and to explore the factors related to these feelings. Specifically, we examine the impact of guilt on family caregivers' decision-making. Our research findings indicate that feelings of guilt among family caregivers play a significant role in the caregiving process.

Family caregivers generally feel guilty, but the manifestations and impacts of this emotion vary in different contexts. This study identified three typical latent profiles of caregivers' feelings of guilt through latent profile analysis: the low, moderate, and high guilt groups. Caregivers in the low guilt group exhibited the lowest levels of guilt (Thomas S et al,2024). The analysis found that these caregivers usually have strong self-regulation skills and can effectively manage their emotions and stress (Stone SM et al,2025). At the same time, they receive strong family support, with interactions and support among family members being more frequent, which to some extent alleviates the caregivers' psychological stress (White Makinde K,2025). Caregivers in the moderate guilt group exhibited intermediate guilt levels. These caregivers often face prolonged and intensive caregiving and experience some degree of post-traumatic stress (Liang J et al,2019). Their levels of family support and self-regulation skills are relatively low, but they can still cope with caregiving challenges (Shen A et al,2023). Caregivers in the high guilt group showed high levels of guilt. This group of caregivers usually undertakes long-term caregiving responsibilities and bears the heavy burden of caring for multiple care recipients (Evans BC et al,2017). Additionally, their family support is low, and their self-regulation skills are poor, making it difficult for them to cope effectively with caregiving-related pressures and challenges. Together, these factors contribute to their high levels of guilt (Tong H et al,2022).

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levels of guilt. This group of caregivers usually undertakes long-term caregiving responsibilities and bears the heavy burden of caring for multiple care recipients. Additionally, their family support is low, and their self-regulation skills are poor, making it difficult for them to cope effectively with caregiving-related pressures and challenges. Together, these factors contribute to their high levels of guilt (Tong H et al,2022). One difference may stem from differences in sample characteristics or research design. The stronger the caregiver's post-traumatic stress symptoms, the higher the sense of guilt. This may be due to traumatic events and emotional stress experienced during caregiving, which can cause severe psychological stress reactions among caregivers, further exacerbating feelings of guilt. Similarly, Jose JM and Gawali G (Jose JM, Gawali G 2025) discovered that post-traumatic stress is closely related to the psychological distress and guilt of caregivers. However, in contrast, Covers may not have found a significant association between post-traumatic stress symptoms and feelings of guilt in their research, possibly because the severity of trauma experiences in their sample was low (Covers MLV et al,2021). We also found that the higher the self-regulatory ability, the lower the sense of guilt. Caregivers with strong self-regulation are better able to cope with stress and emotional fluctuations, effectively alleviating feelings of guilt. Related research also indicates that self-regulation is an important buffer in coping with caregiving stress (Wilson IM et al,2025). However, another study showed that the relationship between self-regulation ability and feelings of guilt is not significant in high-pressure environments, suggesting that the impact of self-regulation may be limited or delayed in specific situations (Vers JH et al,2021). Lastly, the stronger the family support, the lower the feelings of guilt. However, Lu S (Lu S et al,2020) found that the type and quality of family support are more important than the total amount of support. Moreover, specific forms of support, such as emotional support and instrumental support, may have different impacts on feelings of guilt.

The influence of nursing

The research findings have important implications for nursing practice. First, healthcare institutions should strengthen support for family caregivers and provide psychological counseling and resource support to help reduce guilt and psychological pressure. Specific measures include psychological consultation and support: providing professional psychological counseling services helps caregivers manage emotions and stress and enhances their self-regulation abilities. In group counseling, caregivers can share experiences and feelings and receive emotional support. Through family therapy, interactions and support among family members are improved, enhancing the overall coping ability of the family. Provide family education courses to strengthen family members' mutual understanding and support for patients and the caregiving process. Establish a comprehensive support system to provide ongoing support for family caregivers, including caregiving skills training, health management education, and resource

linkages to help caregivers better respond to caregiving challenges. Reducing the burden of care. By providing policy support, family caregivers' burden of care can be alleviated. For example, providing financial assistance, support, care leaves, and community care services helps share some of the care tasks.

Research Limitations

Although this study revealed the heterogeneity of guilt among family caregivers of elderly patients with multiple comorbidities and their influencing factors, there are still some limitations. This study adopted a cross-sectional design and therefore cannot establish causal relationships. Future research should consider using a longitudinal study design to better understand the dynamic changes of guilt and its long-term effects. In addition, the study sample was drawn from Renmin Hospital of Wuhan University, which may introduce regional and sample selection biases, limiting the generalizability of the findings. Future research should expand the sampling scope and increase the diversity of samples from different regions and cultural backgrounds to improve the generalizability of the results. The research data mainly rely on caregivers' self-reports, which may be affected by social desirability bias and recall bias. Future studies should combine multiple data sources, such as doctor assessments and patient reports, to improve the accuracy and reliability of the data.

Conclusion

This study explores the heterogeneity of guilt feelings in family caregivers of elderly patients with comorbidities and the factors influencing these feelings, aiming to better understand the caregivers' psychological state. These findings provide a new perspective. Research suggests that the number of diseases in patients, the duration of care, caregivers' post-traumatic stress symptoms, self-regulation ability, and the level of family support are important factors affecting feelings of guilt. Future nursing practices should focus on improving family support and enhancing caregivers' self-regulatory capacity through various intervention measures to reduce their feelings of guilt and psychological stress, thereby improving overall caregiving quality. Understanding and supporting family caregivers is essential not only to reduce their guilt and stress but also to improve the quality of care, which can promote harmony and happiness within the family.

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