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Impact of Medical Consumption Willingness Intensity of Patients' Families on Overtreatment among Elderly Patients: An Empirical Analysis Based on Questionnaire Surveys

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Abstract. Population aging has intensified overtreatment among elderly patients. Existing research focuses mainly on the supply side of medical institutions while ignoring family members' medical consumption willingness as a demand-side driver. Based on 430 questionnaires from family caregivers, this study divides samples into 208 respondents with elderly care experience and 222 without. Cross-analysis across gender, education, and income is conducted to explore the association between family members' medical consumption willingness and elderly overtreatment. Low-income family members are less capable of judging treatment necessity. Respondents without care experience hold idealized medical expectations, whereas experienced caregivers make more rational decisions. Blind treatment preference, stratified health literacy, and doctor-patient information asymmetry jointly led to irrational medical expenditure. This paper proposes a collaborative governance framework covering family value guidance, advance care planning promotion, stratified health education, and standardized hospital communication to mitigate overtreatment among the elderly.

Keywords: Overtreatment, Patient Family Members, Medical Decision-making

1. Introduction

China's ongoing population aging has steadily expanded the scale of elderly chronic and end-stage patients, leading to a rapid increase in medical demand. Existing systematic reviews confirm that many terminally ill elderly patients receive clinically futile aggressive treatment, causing inefficient consumption of healthcare resources and medical insurance funds [1]. While universal medical insurance has improved elderly patients' access to medical services, overtreatment is widespread. Typical manifestations include excessive examinations, unnecessary prolonged hospitalization, and overmedication. These problems impose heavy economic burdens on families and raise health risks such as adverse drug reactions and nosocomial infections, making this issue an urgent public health concern.

Most previous studies focus on the supply side of medical institutions, attributing overtreatment to institutional profit motives and doctor-patient information asymmetry, while neglecting family

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members' decision-making role. Due to declined cognitive and physical abilities, elderly patients usually rely on family members for medical decisions. Affected by traditional filial piety norms, many families equate high medical investment with moral obligation and tend to pursue aggressive treatment out of guilt or public opinion pressure [2]. Lacking clear cognition of overtreatment's definition and harms, family members often cannot distinguish necessary treatment from redundant medical services, making their subjective willingness a critical driver of elderly overtreatment [3].

Based on 430 valid online questionnaire responses, this study classifies samples according to elderly care experience and conducts cross-analysis on gender, education, and household income. It explores the relationship between family medical consumption willingness and elderly overtreatment and explains the formation mechanism of irrational medical expenditure. Supplementing the insufficient empirical evidence and single perspective of existing studies, this paper proposes a collaborative governance framework covering family value guidance, palliative care popularization, stratified health education, and standardized medical communication. The findings provide localized empirical references for optimizing elderly healthcare governance.

2. Related work

Developed countries in Europe and North America have paid early attention to low-value medical care and caregivers' medical decision-making behavior. Existing studies generally recognize that family members' subjective preferences are a crucial incentive for unnecessary medical expenditures on elderly patients. Scaccia pointed out that psychological factors such as regret aversion and fear of post-treatment guilt drive family members to pursue more intensive medical services. Individual characteristics, including family income, educational attainment, and gender, also significantly shape medical payment decisions [4]. Most foreign empirical studies focus on long-term care, home-based elderly care, and dementia care scenarios and confirm that higher household income is positively associated with families' willingness to pay for medical treatment [5]. Domestic studies have similarly found that family members tend to prefer high-intensity life-sustaining treatment for elderly patients, compared with patients' own choices [6].

However, existing foreign studies are based on individualistic cultural contexts that emphasize patient autonomy, which cannot fully explain China's unique medical scenario dominated by filial piety and family surrogate decision-making. In particular, few questionnaire-based empirical studies have stratified family members according to their medical consumption willingness intensity to analyze specific overtreatment behaviors, such as excessive examinations, overmedication, and long-term unnecessary hospitalization [4-6].

Early domestic research mainly focused on the supply side, explaining overtreatment from the perspectives of hospital profit-seeking, defensive medical behavior, and institutional defects of the medical insurance system. Recent studies have gradually shifted to the demand side and begun to emphasize the influential role of family members. Under the distorted interpretation of traditional filial piety, many family members equate high medical investment with fulfilling moral obligations. Driven by public opinion pressure and psychological burden, they tend to choose aggressive treatment, thereby generating irrational medical willingness [2].

Wang confirmed that guilt motivation affects family medical decisions in ICU scenarios, but the research only provides qualitative descriptions without quantitative data support [7]. From an ethical perspective, Li and Chen proposed that family moral pressure promotes low-value medical treatment, yet their findings also lack empirical verification [8]. Although prior studies have acknowledged that gender, income, and education can affect family attitudes toward medical treatment, several research gaps remain. First, most studies simply conclude that family participation

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exacerbates overtreatment, but few regard medical consumption willingness intensity as a core variable for stratified analysis. Second, insufficient attention has been paid to family members' cognition of overtreatment risks and definitions. Third, existing literature rarely constructs a complete cognition-willingness-behavior logical framework or conducts demographic cross-analysis based on questionnaire data, most relevant conclusions rely on theoretical discussion or small-scale interviews [7, 8].

In summary, current domestic and foreign studies predominantly focus on supply-side factors such as medical institutions and medical insurance systems, while systematic demand-side research from the perspective of patient families remains insufficient. This study focuses on family members of elderly patients in China and explores the formation mechanism of overtreatment based on subjective medical willingness, which compensates for the single perspective of existing literature. Using questionnaire data, this paper conducts a cross-analysis of demographic characteristics, medical consumption willingness, and overtreatment behaviors to identify group differences and strengthen empirical evidence. Furthermore, this study integrates China's local cultural characteristics of family surrogate decision-making and filial piety, avoiding the mechanical application of foreign theoretical models and improving the explanatory and practical value of the research conclusions.

3. Methods

This study conducted a questionnaire-based survey using online convenience sampling. Data collection lasted from September 1, 2025, to April 6, 2026. The online questionnaire was developed and distributed via WeChat social networks and other social media platforms. Clear inclusion and exclusion criteria were formulated for respondents. The inclusion criteria were as follows: participants aged 18 years or older who were capable of completing the questionnaire independently. For core samples, additional requirements included having family members aged 60 years or above receiving medical treatment, as well as personal involvement in medical-related expense payment or treatment-plan discussions. Respondents without elderly-care experience served as control samples. Questionnaires were excluded if the response time was less than three minutes, answers contained logical contradictions, or most items were left blank, these responses were regarded as invalid and removed. After screening, 430 valid questionnaires were retained, consisting of 208 core samples with elderly-care experience and 222 control samples without such experience. The samples covered diverse groups in terms of gender, age, educational attainment and household income, which supported multi-dimensional comparative cross-analysis.

A survey introduction was placed at the beginning of the questionnaire to define concepts related to elderly patients and overtreatment and reduce comprehension bias. The questionnaire contained four major sections. The first section covered demographic variables including gender, age, educational attainment and monthly household income, together with screening questions to identify whether respondents had elderly family members under treatment. The second section (Questions 7-11) measured perceptions of overtreatment, assessing respondents' understanding of its definition, typical manifestations and potential harms. The third section measured family members' medical consumption willingness with items covering three dimensions: maximum affordable treatment cost, spending on daily healthcare, and preferences for medical services, corresponding to Questions 12, 16, 17, 18 and 21. The fourth section focused on choices regarding high-cost medical services to explore the association between consumption willingness and overtreatment tendency. The questionnaire adopted single-choice and multiple-choice questions with plain wording, and anonymous responses were adopted to guarantee data authenticity.

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All data processing was performed using the built-in statistical functions of Wenjuanxing. Invalid responses were eliminated first. Descriptive statistics were then carried out for all 430 valid samples to summarize respondents' demographic profiles, cognition status and overall distribution of medical consumption willingness. Cross-analysis was further performed on the 208 core samples grouped by gender, educational attainment, and household income, to compare differences in medical consumption willingness across subgroups and examine how willingness relates to overtreatment tendency. Finally, cognitive differences between the two sample groups were compared. All analytical results were reported in percentage form.

4. Results

4.1. Sample information

A total of 430 valid questionnaires were obtained in this survey. Samples were divided into two groups according to whether respondents had elderly family members aged 60 years or older receiving medical treatment, including 208 participants in the core research sample and 222 in the control sample. For the full-sample demographic distribution, 252 respondents were male and 178 were female. Most participants were middle-aged adults aged 31-50 years, who usually take responsibility for caring for elderly family members. Respondents with a bachelor's degree made up the largest share, whereas few participants had low-level education. In terms of monthly household income, high-income respondents accounted for a relatively large proportion, with 199 participants reporting monthly household income above 12 000 CNY. The sample covered different levels of gender, age, educational attainment, and household income and presented a balanced structure, which allows multi-dimensional cross-analysis on the 208 core family samples as well as comparative research on perceptions between the two groups.

Table 1. Demographic characteristics of respondents

Variables	Categories	Population	Percentage（%）
Gender	Male	252	58.60
	Female	178	41.40
Care-giving experiences	Yes	208	48.37
	No	222	51.63
Age (years)	20-30	63	14.65
	31-40	139	32.33
	41-50	120	27.91
	51-60	80	18.60
	Over 60	28	6.51
Education attainment	Primary school and below	9	2.09

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Table 1. (continued)

Education attainment	Junior high school	17	3.95
	Senior high school / Technical secondary school	48	11.16
	Junior college	51	11.86
	Bachelor's degree	237	55.12
	Master's degree and above	68	15.81
Monthly household income (CNY)	3000 and below	32	7.44
	3001-5000	45	10.47
	5001-8000	58	13.49
	8001-12000	96	22.33
	Over 12000	199	46.28

The sample covered respondents with diverse gender, educational attainment, and household income backgrounds. Detailed demographic characteristics are presented in Table 1.

4.2. Overtreatment cognition analysis

Respondents showed obvious deficiencies in their cognition of overtreatment. In terms of health-knowledge acquisition, only a small number of people proactively learn knowledge about elderly healthcare over the long term. Most respondents seek relevant information only when their family members fall ill. Regarding the concept of overtreatment, merely 43 respondents reported that they understood it very well, while more than half had little or no relevant understanding.

When identifying specific behaviors, most respondents could correctly recognize typical overtreatment such as unnecessary examinations, excessive drug prescriptions, and unnecessary surgery. They also generally believed that elderly people are more vulnerable to overtreatment. Respondents could identify harms caused by overtreatment from multiple dimensions, including finance, physical health, and healthcare resources, and only very few held the view that overtreatment produces no negative impacts. Overall, respondents could distinguish obvious overtreatment behaviors, yet they lacked systematic understanding of the concept itself.

4.3. Distribution of medical consumption willingness

This section includes data from all 430 respondents, covering family members with elderly patients at home as well as potential respondents without elderly patients. Concerning the maximum affordable treatment cost, approximately 48.8 % of respondents could accept treatment costs within 100 000 CNY, and only 12.8 % were willing to bear high-level medical expenses above 500 000 CNY. For monthly spending on daily healthcare, 33.3 % of households spent between 501 and 1000

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CNY. The proportions of households with zero healthcare spending and those spending more than 2000 CNY per month were 8.6 % and 13.5 %, respectively.

Table 2. Distribution of healthcare consumption intention

Indicators	Options	Percentage（%）
Maximum affordable treatment cost (CNY)	50000 and below	22.56
	60000-100000	26.28
	110000-200000	21.40
	210000-500000	16.98
	Over 500000	12.79
Monthly healthcare expenditure (CNY)	No expenditure	8.60
	500 and below	22.79
	501-1000	33.26
	1001-2000	21.86
	Over 2000	13.49

Even with sufficient medical budgets, most respondents rationally evaluate the necessity of medical services instead of blindly accepting all treatment recommendations. Income significantly affects treatment choices, with 20.2 % reporting that financial conditions strongly shape their plan selection. For costly services, including high-end examinations and imported drugs, treatment effect and household affordability are the main decision-making criteria.

According to the above data, most respondents are willing to spend moderately on elderly family members' health whether they provide care or not. However, their medical consumption willingness and behaviour are generally constrained by income, reflecting an overall rational mindset.

5. Cross-analysis of medical consumption willingness among family members with different characteristics

This section included 208 family respondents (114 males, 94 females) with elderly patients at home. A comparative analysis was conducted with gender, educational attainment, and household income as independent variables and medical consumption willingness items as dependent variables. With real-world medical-seeking experience, this group's practical willingness can reduce biases stemming from idealised treatment expectations.

5.1. Gender factor

Cross-analysis showed that 47.37 % of men would directly accept doctors' recommendations under sufficient budgets, compared with 37.23 % of women. 13.16 % of men were willing to bear treatment costs above 500 000 CNY versus 8.51 % of women, whose expected expenditure mainly fell within 60 000-100 000 CNY, indicating lower medical consumption willingness. Little gender gap existed in monthly healthcare spending. Men tended to follow doctors' advice for high-end services, while women balanced treatment effect and household finance, 31.58 % of men reported strong financial constraints versus 11.70 % of women.

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Men with stronger consumption willingness face higher risks of overtreatment when funds are adequate. By contrast, women make more conservative and trade-off-based decisions and rarely choose unnecessary services. Such differences may stem from women's more thoughtful decision-making as well as their relatively limited disposable resources, which restrain high-value medical spending.

5.2. Educational attainment factor

Cross-analysis indicates that medical consumption willingness increases with educational attainment. Among respondents with a junior high-school education, 71.43 % could only afford treatment costs below 100 000 CNY, compared with 16.67 % of those holding a master's degree or above, 20 % of the latter group were willing to bear expenses exceeding 500 000 CNY. Monthly healthcare expenditure also rose with education level. No respondents with a master's degree or above reported zero healthcare spending, and 26.67 % spent over 2000 CNY each month, whereas low-education respondents showed weaker willingness to pay. Under sufficient budget conditions, respondents with high-school or technical secondary education had the highest proportion (52.94 %) of directly accepting doctors' recommendations. Despite stronger financial capacity, better-educated respondents tended to independently judge the necessity of medical services. 35.71 % of junior high-school respondents stated that income greatly limited treatment options. In contrast, all respondents with a master's degree or above prioritized treatment effectiveness while referring to professional medical advice.

In terms of overtreatment risks, respondents with higher education generally have better affordability and health awareness, so they are less likely to accept unnecessary medical services blindly. Nevertheless, they may still receive redundant medical interventions due to fewer financial restrictions. By comparison, family members with low educational levels face budget constraints and lack adequate medical judgement, making them more vulnerable to passively receiving excessive medical care.

5.3. Household income factor

Cross-analysis shows a distinct positive correlation between household income and medical consumption willingness. 56.52 % of low-income respondents could only afford treatment below 50 000 CNY, compared with only 11.11 % of high-income respondents (monthly income above 12 000 CNY), among whom 24.69 % could bear costs over 500 000 CNY. Monthly healthcare expenditure rose with income: only 3.70 % of high-income participants had zero spending, and 22.22 % spent more than 2000 CNY monthly, while low-income groups showed low healthcare willingness. Under adequate budgets, the 8001-12 000 CNY group had the highest rate (51.16 %) of accepting doctors' recommendations directly. 52.17 % of low-income respondents linked higher willingness to greater overtreatment risk, but high-income respondents regarded this correlation as weak. Low-income participants prioritized costs in decision-making, whereas high-income respondents focused on treatment effectiveness and medical advice and would negotiate alternative plans rather than borrow blindly for care.

Accordingly, high-income families with stronger affordability can rationally assess medical needs, yet they may still select redundant services due to losing financial limits. Although constrained by budgets, low-income families may impulsively pursue "treatment at all costs" in specific situations, bringing potential overtreatment risks. These differences are largely shaped by household financial capacity.

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5.4. Correlation between medical consumption willingness and overtreatment tendency and group cognitive differences

For the 208 family respondents with elderly patients, medical consumption willingness was significantly associated with overtreatment risk. 40.87 % believed higher spending willingness increases overtreatment risk, 47.12 % saw partial correlation, and 12.02 % found no link. Under sufficient budgets, 42.79 % would accept potentially excessive medical suggestions, yet only 12.98 % could reliably evaluate treatment necessity. High-income and better-educated respondents reported stronger consumption willingness but relied on health literacy to avoid unnecessary care. Low-income and less-educated groups faced affordability limits, though poor medical awareness might lead to impulsive spending. Men exhibited higher overtreatment risk with adequate funds.

Noticeable cognitive gaps existed between respondents with and without care giving experience. Those without care experience held idealized expectations, overestimating their financial capacity and ignoring the spending-overtreatment connection. Care-exposed families were more cost-conservative, nearly half could only afford treatment under 100 000 CNY. Over 80% acknowledged that high consumption willingness may cause overtreatment and perceived its harms realistically.

6. Optimized governance countermeasures and policy suggestions

Based on family medical consumption characteristics, overtreatment risks, and multi-causes, suggestions are put forward from family, social, and medical-institution dimensions.

First, strengthen science popularization of basic medical knowledge and overtreatment, mitigate the impulse of "treatment at all costs," and guide families to balance financial conditions and elderly patients' actual conditions when making medical decisions. Second, promote advance-care-planning concepts. Respect patients' medical autonomy within local cultural backgrounds and cut unnecessary spending caused by family subjective will. Third, carry out targeted community health education, especially for low-income and low-education groups, to correct unrealistic medical expectations. Fourth, standardize hospital communication and informed-disclosure mechanisms. Medical workers should empathize with families, distinguish essential treatments from optional services, fully inform them of pros and cons of treatment options, reduce information asymmetry, and avoid irrational overtreatment.

7. Conclusion

Cross-analysis identifies three key family-level drivers of elderly overtreatment: blind treatment-seeking attitudes, uneven health literacy, especially among low-income and less-educated groups, and divergent medical willingness shaped by gender and household income. Family values, insufficient public health education, and inadequate clinical guidance jointly contribute to irrational overtreatment. Respondents without caregiving experience hold idealized medical expectations and underestimate risks, while those with real-world experience make more rational decisions under financial constraints.

Curbing elderly overtreatment requires multi-party collaboration among families, society, and medical institutions to regulate medical consumption from cognition and practice perspectives.

Admittedly, this study has limitations. The sample size of 208 is small, urban-rural differences and disease severity are not analysed, limiting generalizability. Data rely on questionnaire self-reports without objective medical records, which may cause response bias. Only gender,

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educational attainment, and household income are included, ignoring medical insurance and elderly-care modes. Future research should expand samples, adopt objective data ,and add more variables for deeper analysis.

References

[1] Ma, Z., Huang, G. Y., Liu, Z., et al. (2024). Prevalence of aggressive care among patients with cancer near the end of life: A systematic review and meta-analysis. *eClinicalMedicine, 71*: 102561. Doi: 10.1016/j.eclinm.2024.102561.

[2] Huang, C. X. (2024). Cultural and policy considerations for the comprehensive promotion of hospice and palliative care. *People's Daily*, 2024-03-20 (006).

[3] Yu, M. G., Wei, J. M., Ren, R. (2018). Investigation and analysis of patients' cognition and behavior regarding overtreatment. *Medicine and Philosophy (A), 39*(9): 81-84. Doi: 10.12014/j.issn.1002-0772.2018.09a.18.

[4] Scaccia, J. (2025, January 24). Why patients demand unnecessary treatments [EB/OL]. [2026-07-18] https://www.thisweekinpublichealth.com/2025/01/24/unnecessary)-medical-care/.

[5] Zhu, T. T., Liu, D. L., van der Heide, A., et al. (2022). Preferences and attitudes towards life-sustaining treatments of older Chinese patients and their family caregivers. *Clinical Interventions in Aging, 17*: 82485. Doi:10.2147/CIA.S395128.

[6] Kwon, J. H., Han, E. J., Lee, S. (2023). An analysis of the effects of the income level of the family caregiver on willingness to pay for long-term care services. *Journal of Korean Gerontological Nursing, 25*(2): 45-53. Doi:10.17079/jkgn.2212.20001.

[7] Wang, C. Y. (2024). An exploration of the psychological motivations of family members regarding overtreatment of older patients from an ICU perspective. *Medicine and Philosophy, 45*(11): 62-66. https://kns.cnki.net/kcms2/article/abstract?v=3uoqIhG8C44YLTlOAiTRKu87-SJxoEZGimN83jedgM_c2H6Ty8zPXvLyPkmFJsVkruGcqGRQ4OqYbeZHw8eGqdJXBqPL8zoUci0qOxoJOEUvaxiaMajw==&uniplatform=NZKPT.

[8] Li, H. Y., Chen, M. (2022). Reflection on the dilemmas of medical decision-making for family members of older patients from the perspective of filial piety ethics. *Chinese Medical Ethics, 35*(7): 765-770. https://kns.cnki.net/kcms2/article/abstract?v=3uoqIhG8C44YLTlOAiTRKu87-SJxoEZGimN83jedgM9cG2hVh-i-YF2jQ-fXjYl6K-A0Y6l8Kd9o0rT3a9lXz0rQ2W40q2GzQ==&uniplatform=NZKPT.