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ORIGINAL RESEARCH

The Relationship Between Personality and Self-Management Behavior in Chinese Young and Middle-Aged People with Chronic Illness: The Chain Mediating Role of Family Health and Health Literacy

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Purpose: Although the factors influencing chronic disease self-management have been extensively investigated, the ways in which personality traits, family health, and health literacy influence self-management require further exploration. This study aimed to explore the relationships and pathways among personality traits, family health, health literacy, and chronic disease self-management, with the goal of providing insights for chronic disease management.

Patients and Methods: This study was based on a national cross-sectional survey conducted in 2021, which included 1063 young and middle-aged individuals (aged 19–59) with chronic diseases. Structural equation modeling was used to analyze the path relationships between personality traits, family health, health literacy, and chronic disease self-management levels.

Results: Agreeableness directly and negatively predicted self-management outcomes (estimate: −0.557, 95% CI: −0.964 to −0.149). When examining health as the mediating variable between personality traits and self-management, it was observed that although different personality traits exert either positive or negative influences on family health, family health invariably had negative impact on self-management to varying extents ($\beta_{extraversion}$: −0.111, P<0.01; $\beta_{agreeableness}$: −0.083, P<0.05; $\beta_{conscientiousness}$: −0.113, P<0.01; $\beta_{neuroticism}$: −0.111, P<0.01; $\beta_{openness}$: −0.107, P<0.01). However, when considering the chain mediation effect, family health could positively influence health literacy, which subsequently had a beneficial impact on self-management. Additionally, health literacy served as an independent mediator in the relationship between extraversion and openness and self-management, with indirect effects of 0.163 and 0.274, respectively.

Conclusion: Different personality traits exerted varying effects on self-management, which could be either direct or indirect, through the mediating roles of family health and health literacy. Family health seemed to be a double-edged sword for self-management. Future chronic disease self-management should consider the importance of family health, health literacy, and the complex pathways through which personality traits influence management behaviors, to maximize self-management outcomes.

Keywords: personality traits, family health, health literacy, self-management, chronic illness

Introduction

The global prevalence of chronic diseases has escalated significantly in recent decades, becoming one of the leading contributors to morbidity, disability, and premature mortality worldwide. In China, the prevalence of chronic diseases among younger populations has become increasingly pronounced. Data from a national survey reveal that between 2007 and 2017, the prevalence of hypertension among individuals aged 20~29, 30~39, 40~49, and 50~59 in China rose from 7.0%, 13.5%, 26.4%, and 39.3% to 11.6%, 19.3%, 31.8%, and 46.3%, respectively.[1] By 2019, the proportion of middle-aged and younger individuals diagnosed with chronic kidney disease had reached 82.7%, while the percentage of individuals aged 45~64 years among those with chronic disease comorbidity increased from 34.67% in 2009 to 46.97% in 2018.[2,3] However,

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young and middle-aged adults—typically in the prime of their productive years—face not only the direct health impacts of chronic illness but also the broader social, economic, and psychological burdens associated with long-term disease management. Consequently, effective self-management of chronic conditions has become a cornerstone of public health strategies aimed at improving quality of life, reducing healthcare costs, and preventing disability in this population.

Self-management of chronic diseases is defined as an individual's ability to understand the disease, adhere to a treatment plan, and actively engage in decisions related to disease management.[4] It plays a crucial role in the long-term management of chronic conditions, as it can significantly reduce the risk of disease progression, improve health outcomes, and enhance quality of life.[5–7] However, the extent to which individuals engage in self-management behaviors is influenced by a variety of factors, including personality traits, family health history, and health literacy levels.

While existing studies have explored the individual effects of personality, family health, and health literacy on self-management behaviors, there has been limited attention given to how these factors interact with one another, particularly among young and middle-aged Chinese adults with chronic illnesses.[8–10] Given the significant roles both personality and family play in shaping health behaviors, it is crucial to examine how personality traits interact with family health and health literacy to influence self-management. Moreover, understanding these interactions is particularly important within the context of China's family-oriented culture, where the influence of family involvement and health literacy may differ markedly from that in Western populations. Therefore, this study aimed to fill this gap by exploring the relationship between personality traits and self-management behaviors among young and middle-aged Chinese individuals with chronic diseases, with a particular focus on the mediating roles of family health and health literacy.

Theory and Hypothesis

Personality Traits and Self-Management

The five-factor personality model categorizes personality traits into five dimensions: extroversion, agreeableness, conscientiousness, neuroticism, and openness, and these dimensions can provide insights into individual behavioral tendencies, with research indicating that people with certain personality profiles are more likely to engage in proactive health management practices.[11] Conscientious individuals, for example, are often characterized by high levels of self-discipline, organization, and responsibility, all of which are conducive to consistent self-management behavior.[12] Conversely, neurotic people are more likely to experience negative emotions, be unable to cope with stress, and choose behaviors that are detrimental to disease management.[13] A meta-analysis has once again substantiated the relationship between personality traits and self-care, demonstrating that characteristics such as openness, conscientiousness, and agreeableness are associated with enhanced self-care behaviors, whereas individuals with high neuroticism exhibit lower adherence to self-care practices.[14] However, the relationship between personality traits and self-management appears to be complex, encompassing both direct and nuanced effects.

Mediating Role of Family Health

Chinese society is characterized by strong family ties, with family members often playing a central role in decision-making and health management.[15] Thus, in the Chinese context, the relationship between personality and self-management behavior is further complicated by cultural and family factors. Family health, including shared health beliefs, practices, and communication patterns, which is conceptualized as a resource that emerges at the convergence of each family member's health, their interactions and capabilities, as well as the family's physical, social, emotional, economic, and medical resources, has the potential to promote or undermine an individual's ability to effectively manage their chronic disease.[16] Extroverts and outgoing people tend to be good communicators, better able to maintain and strengthen close relationships, have more positive family relationships, and receive more family support, which promotes self-management.[17] However, as demonstrated by the modified resilience model of adjustment and adaptation in ethnic family systems, familial happiness constitutes a pivotal component of crisis response, and the "collective" perspective on happiness prevalent in Eastern cultures underscores a worldview characterized by self-effacement and self-denial, which prioritizes communal objectives over individualistic pursuits.[18] Furthermore, China is profoundly influenced by Confucian culture, which emphasizes familial relationships grounded in mutual and reciprocal obligations.[19] This

cultural framework attributes significant importance to self-sacrifice, making it socially acceptable for family members to prioritize the well-being of others over their own health.[19] Therefore, when taking into account the strong sense of responsibility and tolerance of the conscientious and agreeable individuals, the individuals may put the interests of the collective family above individual needs to maintain the values of "family first" and "harmony" is the "most important", thus adversely affecting the self-management.

Secondary Mediating of Health Literacy

Health literacy, defined as the ability to obtain, process, and understand basic health information to make informed decisions, has been recognized as a critical factor in the successful management of chronic illness.[20] Health literacy influences not only an individual's understanding of their condition but also their ability to navigate healthcare systems, adhere to treatment plans, and adopt lifestyle changes.[21–23] It is well established that individuals with higher levels of health literacy are more likely to engage in self-management behaviors, whereas those with limited health literacy often face challenges in understanding medical instructions and following prescribed treatment regimens.

As the social environment in which individuals make health-related decisions evolves, health literacy is increasingly viewed not merely as an individual attribute, but as a family characteristic that plays a crucial role in promoting overall health and well-being.[24] Health literacy is shaped by a variety of factors, including individual personality traits and family health dynamics. A study from Switzerland showed that open-minded people had higher levels of health literacy, while neurotic individuals were more likely to have poor health literacy.[25] Moreover, family can improve health literacy by providing appropriate information resources and emotional support.[26]

Based on the above theoretical basis, we proposed the following hypothesis, and the hypothetical model is shown in Figure 1:

- Hypothesis 1 (H1): There was a correlation among the personality traits, family health, health literacy, and self-management of young and middle-aged patients with chronic disease.
- Hypothesis 2 (H2): Personality traits, family health, and health literacy could directly predict self-management behavior.
- Hypothesis 3 (H3): Family health and health literacy mediated the influence of personality traits on self-management, respectively.
- Hypothesis 4 (H4): Family health and health literacy formed a chain intermediary in the relationship between personality traits and self-management outcomes.

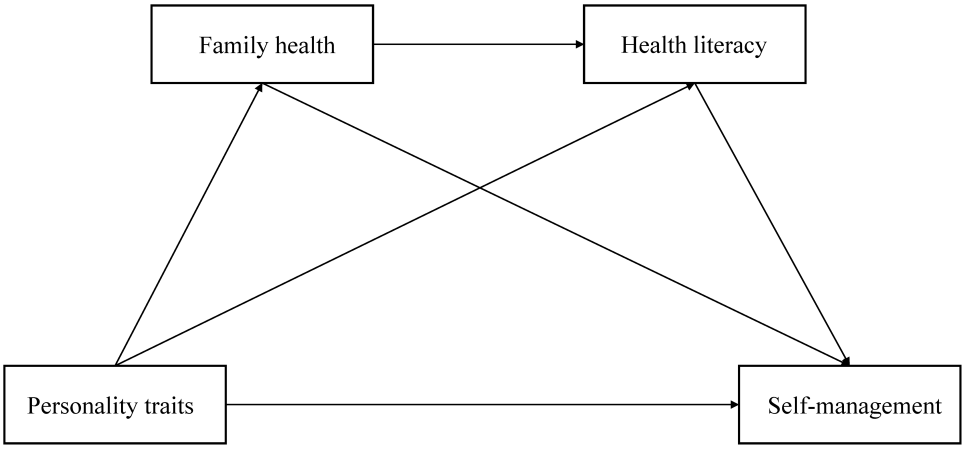

Figure 1 The hypothetical model.

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Methods and Materials

Participants and Procedures

The participants in this study were drawn from the 2021 Psychology and Behavior Investigation of Chinese Residents (PBICR) representing the most recent available data. PBICR utilized a multi-stage sampling method, which covered 120 cities across China. Based on the data results of the "Seventh National Population Census in 2021", a quota sampling was conducted among 120 urban residents (with quota attributes of gender, age, and urban-rural distribution), ensuring that the gender, age, and urban-rural distribution of the obtained sample basically conform to the population characteristics. The survey was conducted from July 10 and September 15, 2021 with professional investigators administering one-on-one and in-person interviews via the questionnaire platform (wenjuanxing, https://www.wjx.cn/). Multi-field experts were consulted for the selection of questionnaires, and a pre-survey was conducted. Additionally, all investigators received standardized training, and the final selection of qualified response sheets underwent rigorous logical checks and screening to ensure the representativeness, authenticity, and reliability of the research outcomes. The project complied with the Declaration of Helsinki, and ethical approval for the project was granted by the Shaanxi Health Culture Research Center (JKSM-2021-01) and Jinan University (JNUKY-2021-018), and the informed consent of participants was acquired.

In total, 11,031 participants were initially included. After excluding individuals aged ≤18 years and ≥60 years, as well as those with physical disabilities, 1063 young and middle-aged participants with one or more chronic diseases were included in the final analysis.

General Demographic Data

The general demographic information of the participants included gender, age, education level, place of residence, marital status, number of children, family type, housing area, per capita monthly income of the family, whether the family was being in debt, and quantity of medication (excluding health care products). All demographic variables were classified.

Assessment Instruments

10-Item Big Five Inventory (BFI-10)

The BFI-10 was used to measure personality traits. Five aspects of personality, including extroversion, agreeableness, conscientiousness, neuroticism, and openness, were evaluated from "strongly disagree=1" to "strongly agree=5" using Likert's five-point scoring method. Five of the 10 items were scored in reverse. The higher the corresponding dimension score, the more obvious the personality trait. The Chinese version of BFI-10 has been widely used and demonstrated excellent reliability.

Short Form of the Family Health Scale (FHS-SF)

The family health was measured by FHS-SF. The FHS-SF had 10 items in 4 dimensions: family/social/emotional health process, family healthy lifestyle, family health resources and family external social support. The FHS-SF used a 5-point Likert scale, ranging from "strongly disagree" to "strongly agree", with three items rated in reverse. The scale was translated into Chinese by Wang et al,[27] and the Cronbach's alpha was 0.83.

Short-Form Health Literacy Survey Questionnaire (HLS-SF12)

HLS-SF 12 was divided into 3 dimensions, namely health care, disease prevention, and health promotion, with a total of 12 items. The evaluation was conducted using a 4-level score (1=very difficult, 2=difficult, 3=easy, 4=very easy). The standardized health literacy index was calculated using a formula which was health literacy index = (average − 1) * (50/3), and the index range was 0~50, the higher the index was, the higher the health literacy level was. The average in the formula refers to the average of all participating items for each participant. The scale was translated into Chinese by Sun et al,[28] and the Cronbach's alpha was 0.932.

Chronic Disease Self-Management Study Measures (CDSMS)

CDSMS was used to assess chronic patient self-management behavior. The scale consists of three dimensions: exercise, cognitive symptom management practice, and communication with doctors, with a total of 15 items. The exercise section

assessed the weekly duration of each exercise behavior as none=0, less than 30 min per week=1, 30~59 min per week=2, 1~3 hours per week=3, and over than 3 hours per week=4. And cognitive symptom management practice and communication with doctors were assessed by frequency of response to specific events as none=0, occasionally=1, sometimes=2, frequently=3, very often=4, and constantly=5. The higher the score, the better the self-management behavior. The Cronbach's alpha of Chinese version of CDSMS ranged between 0.79 and 0.85.[29]

Statistical Analysis

Descriptive analysis of the data was performed using SPSS version 26.0. Correlations between variables were examined using Pearson's correlation analysis, with both the mean (M) and standard deviation (SD) reported. A correlation was considered statistically significant when the p-value was less than 0.05. Following previous studies, each of the five personality traits was divided into high (score > 6) and low (score ≤6) groups to explore differences in family health, health literacy, and self-management.[30] Since the data were self-reported by participants, Harman's single-factor test was conducted to assess common method bias before model construction. The SPSS PROCESS macro (model 6) was employed to construct the hypothesized model, with general demographic data included as covariates. Standardized path coefficients were reported, and the bias-corrected bootstrap confidence interval (CI), based on 5000 samples, was used to test mediation effects. A CI that did not include zero indicated a significant effect.

Results

General Characteristics of the Participants

Among the participants, the gender distribution was relatively balanced, with 57.2% male and 47.8% female. The age distribution was also fairly even. Most participants (72.4%) had completed at least a high school education, and the majority (62.3%) came from nuclear families. Detailed demographic data are presented in Table 1.

Common Method Bias Test

The results of Harman's single-factor test indicated that 10 common factors were extracted from the items in the BFI-10, FHS-SF, HLS-SF12, and CDSMS. The first factor explained 19.86% of the total variance, which was below the 40% threshold, suggesting that there was no significant common method bias in the data.[31]

Descriptive Statistics and Correlation Analysis

As posited in H1, personality traits exhibited significant correlations with family health, health literacy, and self-management. Both familial health and self-management exhibited a positive correlation with health literacy; however, the relationship between them was not statistically significant. The correlations between variables were shown in Table 2.

Furthermore, when participants were, respectively, divided into low and high groups according to the scores of extroversion, agreeableness, conscientiousness, neuroticism, and openness, significant differences in family health and health literacy emerged across all personality traits ($P < 0.01$) except for neuroticism. The comparative results between specific groups were illustrated in Figure 2.

Testing of Models and Mediating Effects

Based on the findings from the structural equation model, family health was found to negatively predict self-management, while health literacy positively predicted self-management, and personality traits could influence self-management behaviors indirectly through family health and health literacy, which verified H2, H3, and H4. Notably, only agreeableness directly and negatively influenced self-management (estimate: −0.557, 95% CI: −0.964~−0.149), with no significant direct effects observed for other personality traits. The structural equation model and the results of the mediation analysis were presented in Figure 3 and Table 3.

Table 1 Demographic Characteristics of Participants (N=1063)

Variables	Categories	Number (%)
Gender	Male	608 (57.2)
	Female	455 (42.8)
Age (years)	19~45	445 (41.9)
	46~59	618 (58.1)
Educational level	Primary school and below	110 (10.3)
	Junior high school	184 (17.3)
	High school/technical secondary school	214 (20.1)
	Undergraduate/junior college	495 (46.6)
	Master degree and above	60 (5.6)
Place of residence	Urban	825 (77.6)
	Rural	238 (22.4)
Marital status	Unmarried	129 (12.1)
	Married	892 (83.9)
	Divorced	33 (3.1)
	Widowed	9 (0.8)
Number of children	0	162 (15.2)
	1	502 (47.2)
	2	345 (32.5)
	≥3	54 (5.1)
Family type	Conjugal family	136 (12.8)
	Nuclear family	662 (62.3)
	Stem family	149 (14.0)
	Joint family	29 (2.7)
	Single parent family	28 (2.6)
	Dink family	9 (0.8)
	Intergenerational family	9 (0.8)
	Single person family	23 (2.2)
	Others	18 (1.7)
Housing area (m^2)	≤60	56 (5.3)
	61–100	494 (46.5)
	101–150	395 (37.2)
	>150	118 (11.1)
Per capita monthly income of the family (RMB)	≤1500	94 (8.8)
	1501–4500	417 (39.2)
	4501–7500	322 (30.3)
	7501–10500	130 (12.2)
	>10500	100 (9.4)
Whether the family was being in debt	No	584 (54.9)
	Yes	479 (45.1)
Quantity of medication	0	417 (39.2)
	1	305 (28.7)
	2	204 (19.2)
	≥3	137 (12.9)

Discussion

This study explored the relationship between personality traits and self-management behaviors in young and middle-aged Chinese individuals with chronic illness, focusing on the mediating roles of family health and health literacy. The findings offered new insights into the psychological and social factors that influence self-management practices in chronic illness care.

Table 2 Mean, Standard Deviation, and Correlations of Variables (N=1063)

Variables	M	SD	1	2	3	4	5	6	7	8
1. Extraversion	6.17	1.72	1							
2. Agreeableness	6.94	1.55	−0.054	1						
3. Conscientiousness	7.09	1.71	0.110**	0.253**	1					
4. Neuroticism	5.90	1.57	−0.165**	−0.227**	−0.111**	1				
5. Openness	6.19	1.65	0.159**	0.120**	0.050	−0.051	1			
6. Family health	38.25	6.60	0.105**	0.298**	0.311**	−0.136**	0.132**	1		
7. Health literacy	33.31	7.34	0.129**	0.087**	0.159**	−0.094**	0.214**	0.387**	1	
8. Self-management	25.24	10.54	0.074*	−0.075*	0.024	−0.056	0.077*	0.015	0.282**	1

Notes: ** $P<0.01$; * $P<0.05$.

The findings revealed that extraversion and openness were positively associated with self-management, consistent with previous studies suggesting these traits promote proactive engagement in health-related behaviors.[32,33] Extraverts may receive more support for self-care due to their self-confidence and strong social relationships.[34] Open individuals, characterized by their intelligence, curiosity, pursuit of novel experiences, analytical skills, and reflective capacity, might view self-care for chronic diseases as a transformative life experience or an alternative lifestyle, leading to better adherence to self-management practices.[35,36] Additionally, extraversion and openness are considered adaptable personality traits that can effectively respond to complex, dynamic, and unpredictable situations. These traits also facilitate the establishment of goal-oriented friendships, which can enhance the effectiveness of self-management.[37] In contrast, agreeableness, which was negatively correlated with and predicted lower self-management, was the only personality trait to have a direct impact on self-management behavior. This could be attributed to the tendency of highly agreeable individuals to conform to social norms, prioritizing family harmony over independent health decisions.[37] This suggested a potential conflict between relational dynamics and the autonomy required for self-management, highlighting an important nuance in understanding how personality influences chronic illness management.

The results also indicated that conscientiousness was positively associated with both family health and health literacy, suggesting that conscientious individuals may be more likely to engage in behaviors that improve their family environment and overall health knowledge. In contrast, neuroticism was consistently negatively correlated with both family health and health literacy, reinforcing the idea that higher levels of neuroticism may hinder factors beneficial for disease management, possibly due to increased negative emotions.[38,39]

As hypothesized, family health and health literacy played mediating roles in how personality traits influenced self-management, respectively. Specifically, extraversion, agreeableness, conscientiousness, and openness were positively associated with family health, while neuroticism had a negative impact. But the mediating effect of health literacy on the relationship between personality traits and self-management was observed exclusively in individuals with high levels of extroversion and openness. Extraverted and open individuals were more likely to engage in group activities that foster interaction and mutual support. They were also more open to receiving and acting on feedback from family members, which could enhance the emotional health of the family and contribute to a more harmonious family atmosphere.[40] Additionally, these individuals tended to have higher self-confidence, sought out new experiences, and engaged in self-reflection, all of which helped them acquire diverse health information. This enabled them to better evaluate and apply that information, thus improving their health literacy.[25] Individuals with high agreeableness and conscientiousness were more inclined to actively engage with their families, taking on meaningful roles and demonstrating strong organizational skills. They also felt a deep responsibility for the well-being of each family member, which contributed to both the psychological health of individuals and the overall stability of the family unit.[40,41] In contrast, individuals with higher neuroticism were more likely to experience negative emotions such as anxiety, irritability, and mood swings.[42,43] These emotions could create tension and conflict within the family, potentially undermining the emotional climate and overall well-being of the family.

Notably, family health was found to have a negative effect on self-management, leading to negative mediating responses. Previous studies on chronic disease prevention and management have often overlooked the role of the family,

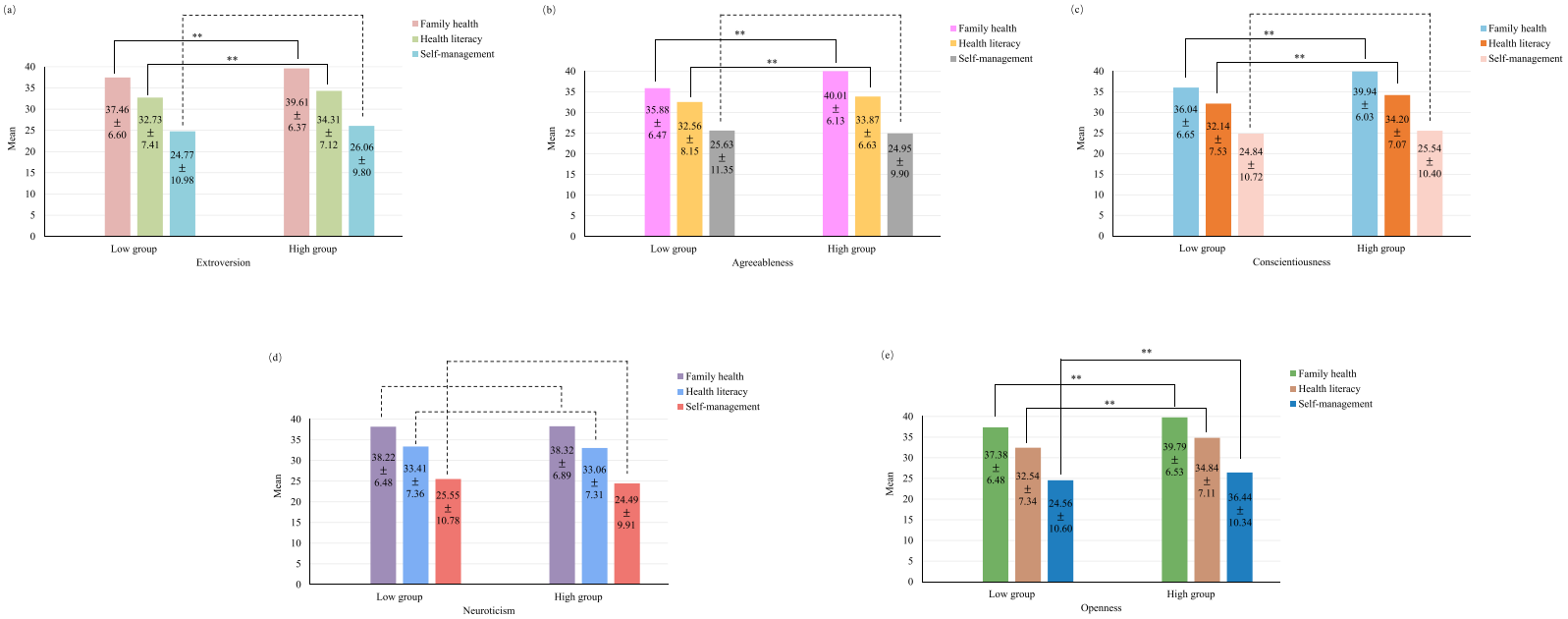

Figure 2 Comparative analysis of family health, health literacy, and self-management across different groups. (**a**) Comparative analysis based on extraversion. (**b**) Comparative analysis based on agreeableness. (**c**) Comparative analysis based on conscientiousness. (**d**) Comparative analysis based on neuroticism. (**e**) Comparative analysis based on openness.
Notes: ** means P<0.01; * means P<0.05.

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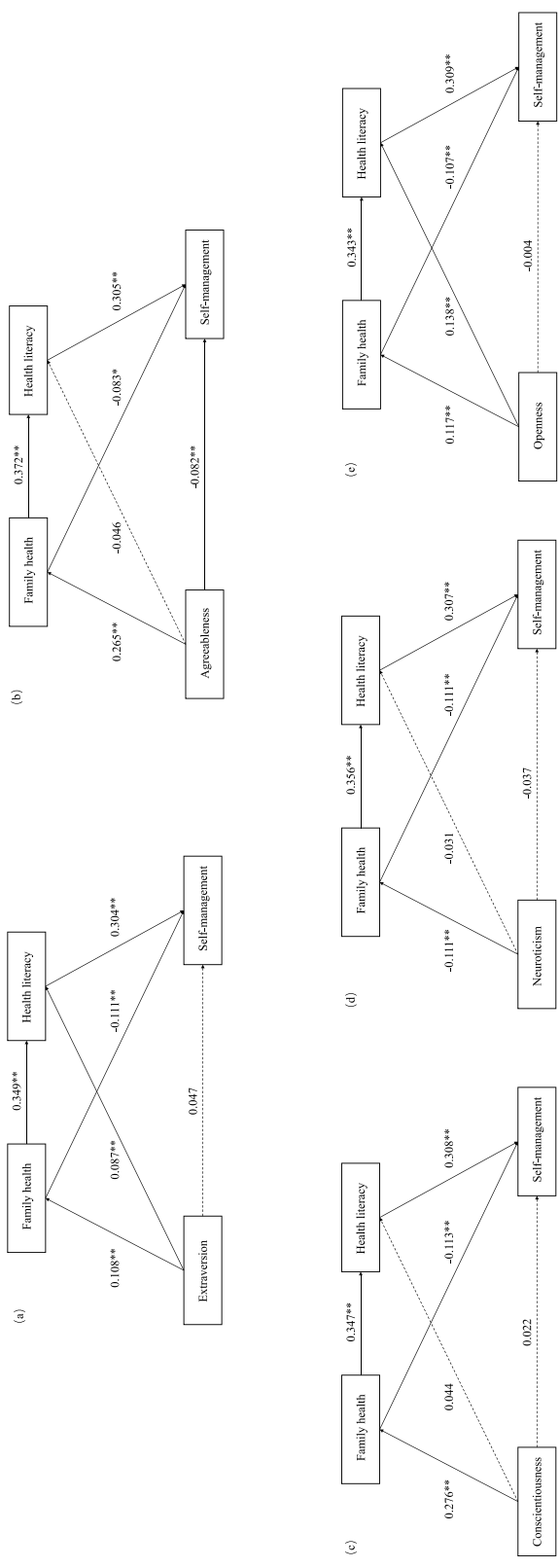

Figure 3 Chain mediation models of personality traits on self-management. **(a)** Chain mediation model of extraversion on self-management. **(b)** Chain mediation model of agreeableness on self-management. **(c)** Chain mediation model of conscientiousness on self-management. **(d)** Chain mediation model of neuroticism on self-management. **(e)** Chain mediation model of openness on self-management.
Notes: ** means P<0.01; * means P<0.05.

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Table 3 Direct and Indirect Effect of the Assumed Model (N=1063)

	Path	Effect Size	95% CI
Extraversion			
Direct effect	Extraversion→SM	0.287	(−0.065, 0.638)
Indirect effect	Extraversion→FH→SM	−0.073	(−0.140, −0.022)
	Extraversion→HL→SM	0.163	(0.061, 0.280)
	Extraversion→FH→HL→SM	0.070	(0.030, 0.120)
Agreeableness			
Direct effect	Agreeableness→SM	−0.557	(−0.964, −0.149)
Indirect effect	Agreeableness→FH→SM	−0.150	(−0.282, −0.026)
	Agreeableness→HL→SM	−0.095	(−0.224, 0.022)
	Agreeableness→FH→HL→SM	0.204	(0.130, 0.294)
Conscientiousness			
Direct effect	Conscientiousness→SM	0.133	(−0.246, 0.512)
Indirect effect	Conscientiousness→FH→SM	−0.191	(−0.319, −0.075)
	Conscientiousness→HL→SM	0.084	(−0.035, 0.202)
	Conscientiousness→FH→HL→SM	0.181	(0.115, 0.262)
Neuroticism			
Direct effect	Neuroticism→SM	−0.248	(−0.638, 0.142)
Indirect effect	Neuroticism→FH→SM	0.082	(0.023, 0.160)
	Neuroticism→HL→SM	−0.063	(−0.188, 0.056)
	Neuroticism→FH→HL→SM	−0.081	(−0.138, −0.032)
Openness			
Direct effect	Openness→SM	−0.025	(−0.405, 0.355)
Indirect effect	Openness→FH→SM	−0.080	(−0.156, −0.025)
	Openness→HL→SM	0.274	(0.147, 0.428)
	Openness→FH→HL→SM	0.079	(0.035, 0.133)

Abbreviations: FM, family health; HL, health literacy; SM, self-management.

focusing primarily on individual-level processes and one-way support. The family constitutes a dynamic and adaptive system, characterized by the allocation and distribution of roles and responsibilities, and membership within this system is often self-defined and sometimes controversial.[44] The collective power of families can play a crucial role in managing chronic diseases that affect multiple family members.[45] Therefore, considering the internal characteristics of individuals, as reflected in their personality traits, the negative impact of family health on self-management can be attributed to the conflict between personal and family interests. In brief, extroverted, agreeable, conscientious, and open individuals tend to prioritize family goals over personal interests, but family goals and personal interests are in conflict. And neurotic individuals may contribute to greater family disharmony, thereby undermining self-management behavior. Furthermore, the cultural dynamics of family decision-making in Chinese society differ fundamentally from those in Western contexts. In contrast to Western families where individual members maintain decision-making autonomy and operate independently without significant interdependence or mutual obligations,[46] Chinese families perceive the household as a holistic entity. This collectivist orientation introduces relational complexities arising from a profound sense of familial responsibility and reciprocal duties among members, and reveals that the negative impact of familial health on self-management may be due to the overall health score, which reflects more than just the sum of individual health components.[16] Therefore, different from previous studies of Western countries confirming that family health had a positive impact on personal health,[47,48] its impact on self-management also had a potentially double-edged nature. It is important to deliberately integrate the family unit into chronic disease management frameworks and find a balance in family health.

The study also identified the chain-mediating roles of family health and health literacy in linking personality traits to self-management. The family is a crucial force and resource in promoting health protection and disease prevention. In a healthy family environment, members tend to have a strong sense of belonging and receive support and nurturing at various life stages, in ways that other systems cannot provide. This support enhances their

overall capacities.[49] In short, family health plays a vital role in fostering health literacy. The importance of health literacy in the self-management of chronic illness is well-established. It enables patients to make informed judgments and decisions in daily life regarding healthcare, disease prevention, and health promotion.[50] The findings of this study emphasized that health literacy contributes to improving self-management, underscoring its significance as a key goal in chronic disease management, influenced by multiple factors, including individual and family dynamics.

Limitations

While this study provided valuable insights into the relationship between personality and self-management in chronic illness, several limitations should be noted. First, the cross-sectional design inherently restricted the capacity for causal inference and lacks temporal dimensionality, thereby failing to capture dynamic changes in study variables over time. As surveys are conducting annually over subsequent years, longitudinal investigations will be implemented to examine the long-term impacts of personality traits on chronic disease management and temporal dynamics from a developmental perspective. Second, the study focused on a Chinese population, which may limit the generalizability of the findings to other cultural contexts. Cross-cultural studies could offer a more comprehensive understanding of how personality traits and family dynamics influence self-management behaviors across different cultural settings. Finally, the study evaluated the total scores of variables such as family health, health literacy, and self-management, which may have caused the effects of each dimension to offset or obscure one another. To improve the path model between personality and self-management, future research should consider decomposing each variable into its individual dimensions for a more detailed analysis.

Conclusion

Our study found that personality traits directly influenced the self-management of middle-aged and young patients with chronic diseases, while also exerting indirect effects through family health and health literacy. And family health played a double-edged role. This highlights the complex pathways through which personality traits impact self-management. Understanding these dynamics is crucial for developing personalized and effective healthcare strategies for individuals with chronic illnesses. These findings contribute to the growing body of literature on personality and health behavior, suggesting that interventions tailored to both the personality profiles of individuals and their family health context, such as the dynamic balance strategy combining the preferences expressed by personality traits and the two-way support of individual and family, could be key to improving self-management outcomes for chronic illness patients. Future research could explore the specific mechanisms that mediate these relationships and investigate interventions designed to address potential conflicts between personality traits and health behaviors in chronic illness management.

Data Sharing Statement

The data in this study came from the Psychology and Behavior Investigation of Chinese Residents. All data could be obtained according to the instructions on the official website (https://www.x-mol.com/groups/pbicr).

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Disclosure

The authors report no conflicts of interest in this work.

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