

# Pathways of Media Contact to Health Literacy in Middle-Aged and Older People: The Chain Mediation Effect of Perceived Social Support and Self-Efficacy

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**Objective:** To understand the status of media exposure, social support, self-efficacy, and health literacy among middle-aged and older adults in China, and explore the impact path of media exposure on the health literacy of this population, providing a reference for promoting their physical and mental health.

**Methods:** From July to November 2022, a multi-stage random sampling method was employed to survey 16,938 Chinese middle-aged and older adults aged 46 and above. Structural equation modeling and statistical analysis were conducted using LISREL 8.8 and Mplus 8.3 software.

**Results:** The average score for media exposure among Chinese middle-aged and older adults was (18.55±5.36), perceived social support was (60.68±12.51), self-efficacy was (28.76±5.40), and health literacy was (35.49±6.05). Statistical results revealed that media exposure has a positive impact on the health literacy of middle-aged and older adults, with a direct effect of 0.091 ( $p < 0.001$ ). Mediation analysis showed that media exposure can affect the health literacy of this population through the independent mediating effects of perceived social support ( $\beta = 0.013$ ,  $p < 0.001$ ) and self-efficacy ( $\beta = 0.029$ ,  $p < 0.001$ ), as well as through a chain mediation effect involving perceived social support and self-efficacy ( $\beta = 0.015$ ,  $p < 0.001$ ).

**Conclusion:** As a pathway for health information dissemination, media exposure plays a crucial role in the intervention of health literacy among middle-aged and older adults. Perceived social support and self-efficacy not only have independent mediating effects but also significant chain mediating effects in the relationship between media exposure and health literacy among this population. Therefore, improving the health literacy of middle-aged and older people can be popularized through media and improved in a multi-path, all-round, and precise way with the help of related technologies and social forces from which media literacy can be improved.

**Keywords:** middle-aged and elderly people, media contact, social support, self-efficacy, health literacy

## Introduction

With the improvement of residents' living standards and the development of healthcare, the mortality rate has decreased, leading to an increase in both the absolute number and proportion of elderly individuals worldwide.<sup>1</sup> According to data publicly available from the World Health Organization, the global population aged 60 and above was one billion in 2019, projected to reach 1.4 billion by 2030, and is anticipated to further rise to 2.1 billion by 2050.<sup>2</sup> Currently, China has become one of the fastest-aging countries in the world. The improvement of health literacy among middle-aged and elderly people is an important link in promoting healthy aging. Good health literacy can not only improve the health status of the middle-aged and the elderly but also improve the well-being of the middle-aged and the elderly.<sup>3</sup> Related research indicates that individuals with lower health literacy levels struggle to comprehend and address health issues,

resulting in the exacerbation of diseases or unfavorable health outcomes. Additionally, a lack of understanding and proper utilization of health information can lead to unnecessary medical services and medication use, contributing to the wastage of healthcare resources.<sup>4</sup> Studies have also found that low health literacy is associated with reduced quality of life, increased healthcare costs, heightened doctor-patient conflicts, and an increased societal burden.<sup>5,6</sup> Health literacy generally refers to the ability to obtain, read, understand, and apply health information to make sound health decisions and follow treatment.<sup>7</sup> Various media form the primary carriers of health information dissemination.<sup>8</sup> Elevating the health literacy levels of middle-aged and older individuals necessitates seeking beneficial health information from diverse media sources, as well as recognizing and applying accurate health information. Due to limitations in physical function and educational level, middle-aged and elderly people have a low usage rate of smart devices and lack necessary health knowledge.<sup>9–11</sup> This paper defines middle-aged and older individuals based on existing research, considering individuals aged 46 and above, with middle-aged individuals falling within the age range of 46 to 59, and older individuals comprising those aged 60 and above.<sup>12</sup> The study aims to explore the relationship between media exposure and health literacy in middle-aged and older individuals, providing insights for enhancing the health status of this demographic group and contributing to the establishment of a healthy aging society.

The crux of enhancing health literacy lies in the acquisition of health information and the utilization of health services. This process is intricately linked to media support, playing a dual role: enabling the public to cultivate skills for augmenting health literacy through information platforms and facilitating health information providers in disseminating pertinent knowledge.<sup>13,14</sup> The World Health Organization has emphasized the indispensability of information in advancing individual health, contending that diseases can be prevented not only through proactive healthcare but also via early detection, with effective information dissemination enhancing treatment outcomes.<sup>15</sup> A growing consensus among medical experts underscores that medical interventions have a limited impact on human health, and the pivotal determinants for promoting health are rooted in lifestyle and living conditions.<sup>16,17</sup> The conveyance of health information serves not only as a preventive measure but also as a potent tool for shaping patient lifestyles and public health.<sup>18</sup> In essence, the transmission of health information is inseparable from various media channels, encompassing television, computers, mobile phones, and literature. Consequently, this study will delve into the correlation between media exposure and health literacy.

Social support refers to the social network providing particular material help and spiritual comfort to some disadvantaged groups.<sup>19</sup> Social support, a social connection manifested in good interpersonal relationships, has been widely discussed in health behaviors and health literacy.<sup>20,21</sup> Cobb et al believed that a higher level of social support, to a certain extent, can alleviate life pressure and psychological problems, which is beneficial to managing mental diseases.<sup>22</sup> Some scholars have also found that social support is closely related to the material and spiritual needs of the elderly<sup>23</sup> and can directly affect the physical and mental health and health behavior of individuals.<sup>24,25</sup> Social networks can provide health knowledge channels, prompting people to be more active in disease prevention and improve their health.<sup>26,27</sup> Relevant studies have also found that the higher the degree of perceived social support, the more health information and resources an individual can obtain, the fewer negative feelings caused by poor health literacy, and the better the promotion of health concepts and behaviors.<sup>28,29</sup> Some studies have also found that media contact can enhance the perception of social support, thereby improving individual self-efficacy and autonomous health.<sup>30,31</sup> This study will also explore the mediating role of perceived social support in the media exposure, self-efficacy, and health literacy of middle-aged and older people.

Self-efficacy denotes an individual's belief in their capacity to engage in specific behaviors and anticipate the outcomes of these behaviors.<sup>32</sup> The impact of self-efficacy on an individual's physical and mental health, as well as health literacy, is increasingly gaining attention.<sup>30,33</sup> Research has established that self-efficacy plays a direct role in shaping an individual's health-related goals, behaviors, and literacy levels.<sup>34,35</sup> Moreover, it has been observed that enhanced self-efficacy contributes to improved medication adherence among elderly individuals with chronic conditions, fostering better self-health management and encouraging an active lifestyle.<sup>36</sup> Furthermore, self-efficacy significantly influences healthy behaviors and individual mental health. Elderly individuals with high self-efficacy demonstrate greater initiative in participating in healthy social activities and adopting health-conscious lifestyles, thereby facilitating the enhancement of health literacy.<sup>37</sup> Additionally, studies suggest a link between elevated self-efficacy and increased media exposure.<sup>38</sup> A positive correlation exists, with higher

degrees of media contact contributing to heightened individual self-efficacy. Concurrently, social support plays a pivotal role in bolstering individual self-efficacy.<sup>39,40</sup> Consequently, this study will explore the mediating role of self-efficacy in the relationship between media exposure, social support, and health literacy among middle-aged and elderly people.

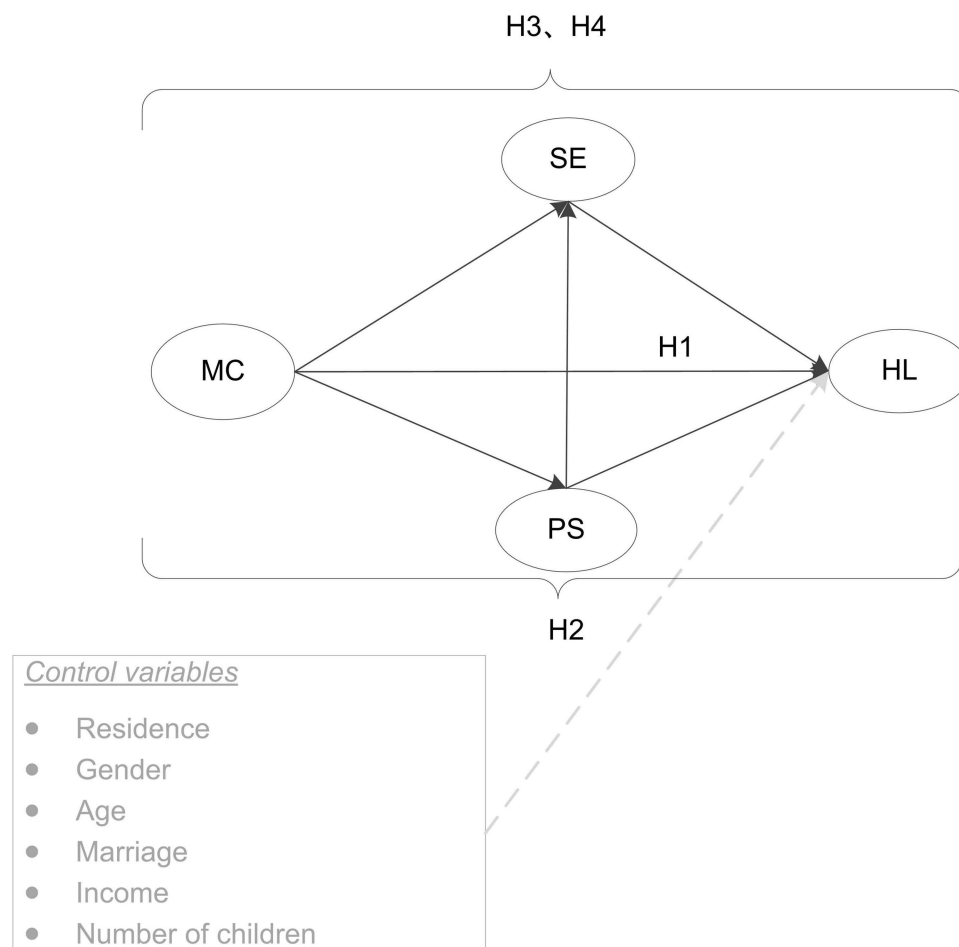
This study mainly explores the relationship between media contact, perceived social support, self-efficacy and health literacy in middle-aged and elderly people. Based on the existing theoretical basis and literature, the research hypotheses are shown in Figure 1: H1) Media contact will be positively correlated with the health literacy of the middle-aged and elderly; H2) perceived social support will have a mediating role in the association between media contact and the health literacy of the middle-aged and elderly; H3) self-efficacy in media contact will be associated with there being a mediating effect in the association of health literacy in the middle-aged and the elderly; H4) there is a chain mediating effect in the association between media contact and health literacy in the middle-aged and elderly.

## Materials and Methods

### Participants

#### Data Collection

From July to November 2022, the research group adopted multi-stage random sampling. The provincial capitals of 22 provinces and five autonomous regions in mainland China and four municipalities were selected, and 5 to 10 cities were selected from the non-provincial capital prefecture-level administrative regions of each province and autonomous region based on the random number table method. In each city, 1–2 surveyors were deployed to conduct one-on-one questionnaire



**Figure 1** Hypothesized model of the research framework.

**Abbreviations:** MC, media contact; PS, perceived social support; SE, self-efficacy; HL, health literacy.

surveys offline. The questionnaires were collected on the spot after completion, with a distribution of 200–300 questionnaires per city. Quota sampling was implemented for residents in the chosen areas based on the results of the seventh census to ensure the representativeness of the selected samples in accordance with population characteristics. In this survey cycle, a total of 52,000 questionnaires were distributed, with 43,926 valid responses collected, resulting in an effective response rate of 84.47%. Middle-aged and older people aged 45 and above were selected from the data as the research subjects. The total number of middle-aged and older people was 16,938, including 8401 middle-aged people (age range is 46 to 59 years old) and 8537 older people (age range is 60 years and above). Inclusion criteria: ① age  $\geq 46$  years old; ② no language barrier; ③ cooperation with the research group members to conduct the survey. Exclusion criteria: ① have obvious cognitive dysfunction and significant language communication impairment or hearing impairment; ② blank responses and similar responses. The Medical Ethics Committee of Binzhou Medical University approved this project (2022–280). This study follows the Declaration of Helsinki, and all participants signed the informed consent.

## Quality Control

In order to promote trust and cooperation among respondents, careful selection was made of local university students and residents to serve as auxiliary surveyors. Following the conclusion of each survey round, surveyors would meticulously review the questionnaires, promptly correcting and supplementing any errors or omissions. For respondents who could not be interviewed face-to-face but provided contact numbers, telephone interviews were conducted to enhance the participation rate of the study subjects. Additionally, post-survey, 5% to 10% of respondents from each city were randomly selected for repeat measurements to assess the reliability of the data. Surveyors also conducted a daily review of the questionnaires collected on that day, promptly addressing any identified issues. During the data entry process, surveyors initially assigned a unified numbering to all received materials, and then employed a dual-entry approach to input data into the database. After the first round of data entry, a cross-check was conducted against the original materials to promptly detect any errors. Furthermore, following the completion of data entry, logical checks were performed on each variable to ensure data accuracy and completeness.

## Measures

### Demographic Characteristics

The questionnaire was developed by the research team, encompassing demographic variables related to middle-aged and older individuals, including residence (rural, urban), gender (male, female), marital status (with or without a partner), age (continuous variable), income (continuous variable), and number of children (continuous variable).

### Media Contact

We referred to Tomczyk et al's investigation on media contact,<sup>41</sup> wherein they devised a proprietary media contact scale tailored for middle-aged and older individuals. The scale incorporates seven dimensions, assessing the frequency of engagement with magazines, radio, television, books (excluding textbooks), personal computers, and smartphones. Respondents utilized a Likert 5-level scoring system, assigning ratings based on frequency levels (1–5): “rarely, occasionally, sometimes, often, almost every day”. Higher scores indicated increased media contact. The composite score ranged from 7 to 35 points, demonstrating satisfactory reliability with a Cronbach's alpha coefficient of 0.775.

### Perceived Social Support

Using the Perceived Social Support Scale (PSSS),<sup>42</sup> as developed by Zimet et al, participants responded to 12 statements reflecting perceived social support from various sources such as relatives, neighbors, and colleagues. The items included perceptions of having someone by their side during problems, the ability to share joys and sorrows, the problem-solving capacity of their family, the availability of emotional help and support from family and friends, and the opportunity to discuss problems with friends. Responses were recorded on a 7-point Likert scale, ranging from strongly disagree (1 point) to agree (7 points). Higher scores indicated higher levels of perceived social support, resulting in a total score ranging from 12 to 84 points. The categorization of support levels was as follows: scores of 12 to 36 represented a low support level, scores of 36 to 61 indicated a moderate support level, and scores of 61 to 84 signified a high support level. The reliability of the scale was assessed using Cronbach's  $\alpha$  coefficient, yielding a highly satisfactory value of 0.956.

## Self-Efficacy

This study employed the New General Self-Efficacy Scale (NGSES), an adaptation by Chen<sup>43</sup> et al derived from the General Self-Efficacy Scale (GSSE),<sup>44</sup> designed to assess individuals' perceptions of self-efficacy. The questionnaire included items such as "I will be able to achieve most of the goals I have set for myself", "When faced with difficult tasks, I am confident that I will be able to complete them", and "I have the information to complete many different tasks effectively". Additionally, items like "Compared to others, I can do most tasks well" were included. The scale comprised eight positively scored items, each utilizing a Likert 5-level scoring system, ranging from strongly disagree (1 point) to strongly agree (5 points). Higher standard scores indicated elevated self-efficacy levels. The cumulative score ranged from 8 to 40 points, demonstrating high internal consistency with a Cronbach's alpha coefficient of 0.947.

## Health Literacy

The cross-sectional survey utilized the HLS-SF12, developed by the Asian Health Literacy Research Consortium, following validation across six countries, resulting in a Cronbach's alpha coefficient of 0.87.<sup>45</sup> In the present study, the health literacy scale demonstrated robust internal consistency with a Cronbach's alpha coefficient of 0.955. The questionnaire encompassed three dimensions: health care, disease prevention, and health promotion, each consisting of four items related to obtaining, understanding, evaluating, and applying health information content. Examples of items included "finding information on treatment for your condition", "understanding what is in the instructions that come with your medicines", and "calling an ambulance in an emergency". Respondents also addressed tasks such as "finding information on how to deal with mental health problems" and "judging which daily behaviors will affect your health", along with "taking appropriate measures to prevent diseases according to the advice of family and friends". Employing a 4-level scoring method, responses ranged from very difficult (1 point) to not easy, easy, and easy (4 points), resulting in a total score range of 12 to 48 points.

## Data Analysis

Excel software was used for real-time statistical input of data; SPSS27 and LISREL8.8, Mplus8.3 software were used for statistical analysis; SPSS was used to analyze the correlation between variables; Cronbach's alpha coefficient was used to evaluate the internal consistency of the scale; and LISREL8.8, Mplus8.3 was used to construct a chain structure equation. In the measurement data, the mean and standard deviation were used to describe and the structural equation model was used to test the mediation effect. Test criteria were  $p < 0.05$ ,  $t$ -value ( $t < 1.96$ ).

## Results

### Descriptive Data

Among the 16,938 middle-aged and older people surveyed, 5334 (31.49%) lived in rural areas and 11,604 (68.51%) in urban areas; 8767 were male (51.76%) and 8171 (48.24%) were female; 8401 (49.60%) were middle-aged and 8537 (50.40%) were elderly. In addition, the average score of media contact of middle-aged and older people in China was ( $18.55 \pm 5.36$ ), the average score of perceived social support was ( $60.68 \pm 12.51$ ), and the average score of self-efficacy was ( $28.76 \pm 5.40$ ). The average health literacy score was ( $35.49 \pm 6.05$ ) points, and media contact, perceived social support, self-efficacy, and health literacy were all correlated,  $p < 0.001$  (Table 1).

### Mediation Analyses

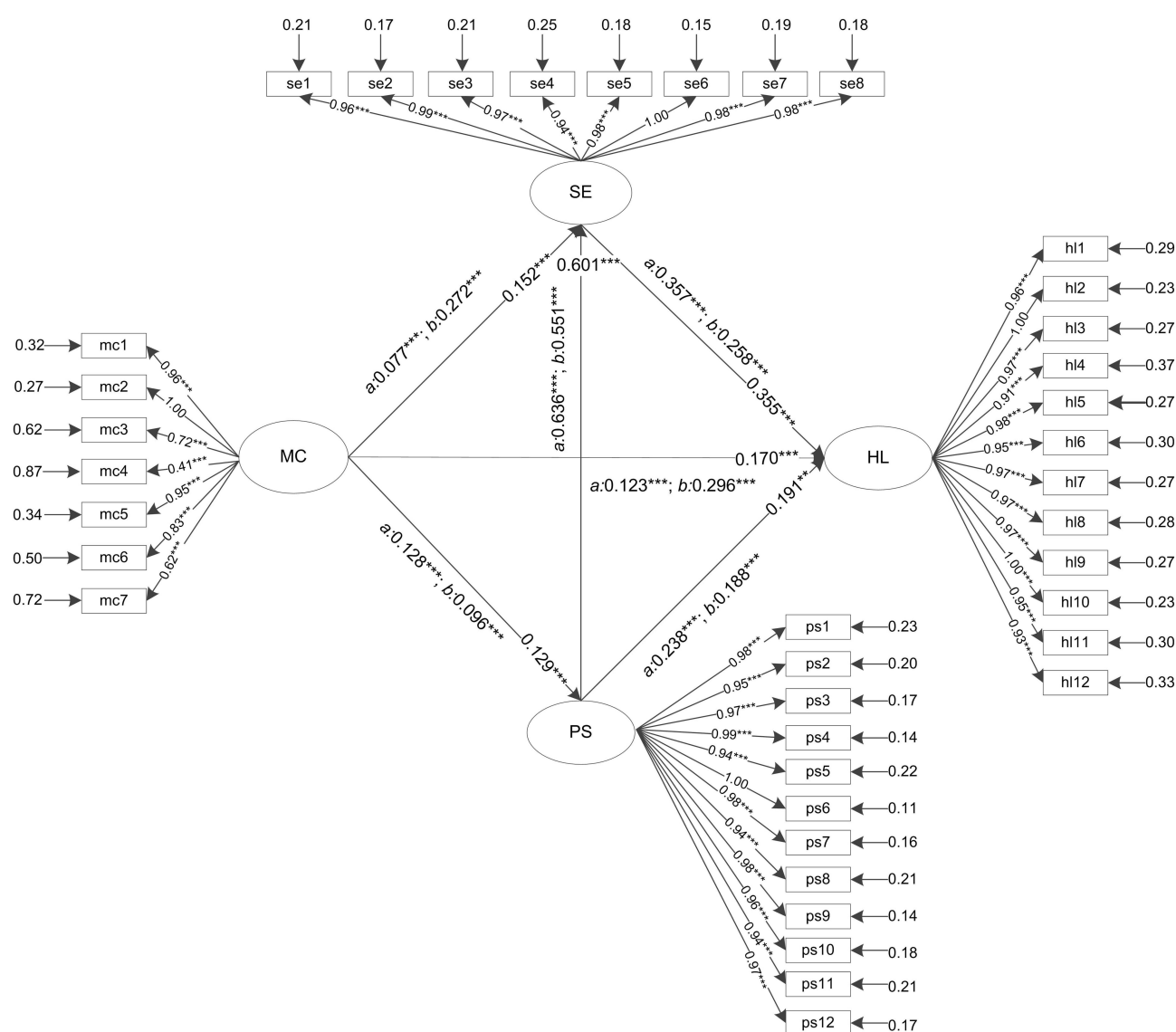
In this study, after controlling for variables such as residence, gender, marriage, income, and number of children, the structural equation model was used to analyze the impact of media contact on the health literacy of middle-aged and older people. To more intuitively explore the pathways through which media exposure influences the health literacy of middle-aged and older individuals, we segmented the model into three parts based on the age of the survey participants. The first part represents the overall middle-aged and older population model, the second part represents the middle-aged population model, and the third part represents the elderly population model. By conducting comparative analyses, we gain a deeper understanding of how media exposure impacts the health literacy of middle-aged and older individuals across different age groups. It was found that the model fit was good, NNFI = 0.95, NFI = 0.94, CFI = 0.95, IFI = 0.95, RFI = 0.94, RMSEA = 0.046, AGFI = 0.97, CN = 470.70, and all fitting indices met the standard. The relationship

**Table 1** Descriptive Statistics and Correlation Analysis Results

Variable	Media Contact	Perceived Social Support	Self-Efficacy	Health Literacy
Media contact	I			
Perceived social support	0.227 ***	I		
Self-efficacy	0.328 ***	0.588 ***	I	
Health literacy	0.392 ***	0.410 ***	0.482 ***	I ***
Mean	18.55	60.68	28.76	35.49
SD	5.36	12.51	5.40	6.05

Notes: \*\*\*  $p < 0.001$ . SD is the standard error.

between the variables in the final model is shown in Figure 2. In contrast, the direct and indirect effects of each indicator are shown in Table 2. In the overall model, the direct effect is 0.091, the total indirect effect is 0.057, and the total effect is 0.148; while for the middle-aged population, the direct effect is 0.064, the total indirect effect is 0.046, the total effect



**Figure 2** The path of media contact's impact on the health literacy of middle-aged and elderly people. \*\*\*:  $p < 0.001$ , a: middle-aged people, b: elder.

**Abbreviations:** MC, media contact; PS, perceived social support; SE, self-efficacy; HL, health literacy.



**Table 2** The Direct and Indirect Effects of Media Contact on the Health Literacy of Middle-Aged and Elderly People

	Point Estimate	Product of Coefficients			BOOTSTRAP 1000 TIMES 95% CI			
	Estimate	S.E.	Est./S.E.	p-value	Percentile		Bias Corrected	
					Lower	Upper	Lower	Upper
Middle-Aged								
PS	0.016	0.004	4.330	<0.001	0.010	0.024	0.010	0.024
NG	0.014	0.004	3.946	<0.001	0.007	0.022	0.008	0.022
PS→NG	0.015	0.003	4.715	<0.001	0.009	0.022	0.009	0.022
TIE	0.046	0.007	6.244	<0.001	0.031	0.060	0.031	0.059
TE	0.110	0.014	7.917	<0.001	0.083	0.137	0.083	0.137
DE	0.064	0.011	6.118	<0.001	0.044	0.085	0.044	0.085
Elderly								
PS	0.009	0.004	2.292	0.022	0.002	0.018	0.003	0.019
NG	0.036	0.008	4.696	<0.001	0.022	0.051	0.023	0.052
PS→NG	0.007	0.003	2.679	0.007	0.002	0.013	0.003	0.013
TIE	0.052	0.009	5.693	<0.001	0.033	0.069	0.036	0.072
TE	0.202	0.020	9.963	<0.001	0.163	0.242	0.162	0.242
DE	0.151	0.019	7.980	<0.001	0.113	0.189	0.112	0.187
Total								
PS	0.013	0.003	5.005	<0.001	0.008	0.018	0.009	0.019
NG	0.029	0.004	7.531	<0.001	0.022	0.037	0.022	0.038
PS→NG	0.015	0.003	5.685	<0.001	0.010	0.020	0.010	0.020
TIE	0.057	0.006	9.492	<0.001	0.046	0.069	0.046	0.069
TE	0.148	0.013	11.750	<0.001	0.124	0.173	0.123	0.172
DE	0.091	0.010	8.692	<0.001	0.072	0.113	0.072	0.112

**Abbreviations:** TIE, total indirect effect; TE, total effect; DE, direct effect.

is 0.110; and for the elderly population, the direct effect is 0.151, the total indirect effect is 0.052, and the total effect is 0.202, among which media contact has a significant positive correlation to the health literacy of middle-aged and older people, with a direct effect of 0.170 ( $p < 0.001$ ), and a total effect on middle-aged people of 0.123 ( $p < 0.001$ ) and a total effect on the elderly of 0.296 ( $p < 0.001$ ). Media contact positively affects perceived social support ( $\beta = 0.129$ ,  $\beta_a = 0.128$ ,  $\beta_b = 0.096$ ,  $p < 0.001$ ) and positively affects self-efficacy ( $\beta = 0.152$ ,  $\beta_a = 0.077$ ,  $\beta_b = 0.272$ ,  $p < 0.001$ ). In addition, media contact can positively affect the health literacy of middle-aged and older people through perceived social support. It can also affect the health literacy of middle-aged and older people through self-efficacy. There is a significant chain mediation effect. H1 to H4 are supported to some extent.

## Discussion

The study employs a chain mediation effect model to examine the causal pathway of media contact influencing the health literacy of middle-aged and older individuals. Findings indicate that media contact exerts both a direct influence on the health literacy of this demographic and an indirect influence mediated by perceived social support and self-efficacy. The impact and mediating effects on health literacy follow three distinct paths: firstly, independent mediation through perceived social support; secondly, autonomous mediation through self-efficacy; and thirdly, a chain mediation effect involving both perceived social support and self-efficacy.

Our findings underscore a pronounced positive influence of media exposure on the health literacy of middle-aged and older individuals, consistent with the outcomes reported by Li.<sup>46</sup> Serving as a pivotal conduit for health information

dissemination, media contact exhibits characteristics of interactivity, timeliness, and diversity,<sup>47</sup> significantly impacting the acquisition, comprehension, and evaluation of health information. This influence contributes to the enhancement of health outcomes among middle-aged and older demographics. However, the challenges faced by the middle-aged and elderly, characterized as “digital refugees” due to their limited knowledge, physical constraints, and reluctance to embrace new technologies, impose restrictions on their access to health information channels, thereby impeding their comprehension, judgment, and application of health knowledge.<sup>48</sup> Consequently, relevant authorities should discern the specific needs of middle-aged and elderly individuals, provide tailored health information services, promote reciprocal learning between these demographics and younger generations, and cultivate intergenerational support networks. Such networks facilitate the exchange of technological skills from younger individuals and the sharing of rich life experiences by older individuals. Elevating media literacy among the middle-aged and elderly can contribute to an augmentation of their health literacy levels.

Our results also found that, the chain mediation effect elucidates the influence and roles of perceived social support and self-efficacy in mediating the relationship between media contact and health literacy among the elderly. Initially, perceived social support encompasses the assistance and aid an individual perceives in social relationships and participation, closely intertwined with the individual’s physical and mental health.<sup>49,50</sup> Studies have demonstrated that perceived social support effectively enhances the cognitive prowess of middle-aged and older individuals, thereby favorably impacting their cognitive health information comprehension and accurate application of health knowledge.<sup>51</sup> In turn, enhanced health literacy contributes to an improved capacity for middle-aged and older individuals to receive social support. The frequency of media contact positively correlates with an individual’s ability to comprehend perceived social support, thereby augmenting social information acquisition and interaction among middle-aged and older individuals,<sup>52</sup> subsequently enhancing health literacy. Secondly, self-efficacy pertains to an individual’s perception, self-evaluation of abilities, and judgment of capabilities in achieving specific goals.<sup>53</sup> Concurrent research has underscored that self-efficacy significantly and positively predicts health literacy levels,<sup>54</sup> consistent with the findings of this study. Moreover, media contact with middle-aged and older individuals indirectly affects health literacy through self-efficacy. Individuals, following media exposure, can mobilize “self-motivation” and “self-regulation” to bolster self-efficacy, thereby influencing health literacy levels.<sup>55</sup> Media contact also impacts self-efficacy through perceived social support, subsequently affecting health literacy. Social choice theory posits that heightened perceived social support elevates self-efficacy among individuals,<sup>56</sup> thereby fostering enhanced health literacy in middle-aged and older demographics. In summary, perceived social support and self-efficacy serve as significant mediators in the relationship between media contact and health literacy among middle-aged and older individuals.

It is noteworthy that the study’s findings highlight a significant divergence in the impact of media contact on health literacy between the elderly and middle-aged individuals. Generally, middle-aged individuals exhibit a broader spectrum of channels for acquiring and applying health information compared to their elderly counterparts. The elderly, constrained by diminished social adaptability, primarily rely on media sources for accessing health information. Additionally, the mediating influence of middle-aged individuals’ comprehension of social support surpasses that of the elderly, while the mediating effect of self-efficacy among the elderly exceeds that observed in middle-aged individuals. It is crucial to underscore specific security concerns related to media information, prompting relevant authorities to intensify information health education initiatives targeting middle-aged and older individuals to mitigate potential network risks.

In conclusion, the enhancement of health literacy among middle-aged and older individuals necessitates a targeted focus on improving their media contact, perceived social support, and self-efficacy. Firstly, proactive measures should be taken to establish a government-driven, multi-stakeholder framework for knowledge capacity building and information service dissemination, specifically tailored to the needs of the middle-aged and elderly population. This initiative includes the development of “aging-friendly” media products and the decentralization of digital education for middle-aged and elderly individuals, facilitating their utilization of media for accessing a broader spectrum of health information, ultimately augmenting health literacy levels. Specific actions may involve the implementation of customized digital literacy training programs aimed at the elderly, covering fundamental computer and internet usage skills to enhance their proficiency in navigating online health resources. Subsequently, leveraging online platforms to deliver targeted health education courses for the elderly, encompassing topics such as prevalent illnesses, healthy dietary practices, physical



exercise, and related subjects, is recommended. Secondly, the imperative to strengthen multi-dimensional perceived social support from family, community, and government is highlighted to create a harmonious social milieu for the elderly. The establishment of support systems within community, family, and social groups is instrumental in alleviating the sense of isolation experienced by the elderly. These support systems serve the dual purpose of providing encouragement and assistance, thereby fostering increased self-confidence. Simultaneously, the articulation of clear, measurable, and achievable goals assists the elderly in gradually accomplishing tasks, thereby enhancing their self-efficacy and contributing to the cultivation of a positive self-perception. Additionally, active engagement in society is encouraged among seniors to augment interpersonal skills, stimulate self-efficacy, and subsequently elevate health literacy levels. Furthermore, there is an opportunity for family doctors and community service personnel to play a role in disseminating health knowledge to the elderly. By setting relevant behavioral science goals, they can harness the subjective initiative of middle-aged and older individuals, improving their access to health information and enhancing their ability to understand, evaluate, and apply health knowledge, thereby progressively elevating the health literacy of this demographic.

## Limitations

Several limitations should be acknowledged in the context of this study. Firstly, the relationships among media contact, perceived social support, self-efficacy, and health literacy are constrained by the cross-sectional nature of the study design. Merely observing correlations among these variables does not establish causality, necessitating further validation through longitudinal data in subsequent research endeavors. Secondly, the reliance on self-reported data from study participants introduces the potential for self-report/recall bias. Nevertheless, sustaining continued participation in cohort studies among middle-aged and elderly cohorts poses challenges, and the significance of the obtained sample size should not be overlooked. Lastly, numerous factors contribute to health literacy, including but not limited to sexual orientation, daily life abilities, and traditional Chinese cultural influences. Future investigations should strive to incorporate a more comprehensive array of factors to holistically explore the multifaceted pathways influencing the health literacy of middle-aged and elderly individuals. Consequently, our findings, exhibiting commendable goodness-of-fit indices, warrant heightened consideration within the scholarly community.

## Conclusions

The ongoing scrutiny of the health literacy status among middle-aged and older individuals is imperative. Moreover, our investigation has illuminated that media contact exerts a direct influence on the health literacy of this demographic and concurrently exerts an indirect impact through the autonomous mediating mechanisms of perceived social support and self-efficacy. These mediation processes unfold through three distinct pathways: firstly, via the autonomous mediation of perceived social support; secondly, through the autonomous mediation of self-efficacy; and thirdly, through the interconnected mediation involving both perceived social support and self-efficacy. Consequently, enhancing social support holds the potential to augment the self-efficacy of middle-aged and older individuals, thereby fostering improvements in their health literacy.

## Data Sharing Statement

The data sets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Institutional Review Board Statement

This study was approved by the Medical Ethics Committee of Binzhou Medical University (2022-280), and all participants signed informed consent.

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## Disclosure

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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