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The Impact of Social Media Dependency on Chinese Netizens' Willingness to Forward Health Rumors: The Moderating Role of Social Media Literacy

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Abstract

In the digital era, the forwarding of false health rumors by netizens causes secondary dissemination of information, leading to its fission-like spread and bringing serious social problems. Based on an empirical survey of Chinese netizens, this paper aims to explore how social media dependency and media literacy affect netizens' willingness to forward health rumors. Data analysis found that social media dependency has a significant positive impact on forwarding willingness, social media literacy has a significant negative impact, and social media literacy has a negative moderating effect on the relationship between social media dependency and forwarding willingness. As the level of netizens' social media literacy changes, the impact of social media dependency on the forwarding willingness is no longer a simple linear positive correlation. High social media literacy will weaken its positive promoting effect and even make it show a negative change.

Keywords: social media literacy, social media dependency, health rumors, forwarding willingness

1. Introduction

In the digital age, the popularity of social media has made information dissemination more rapid and extensive, at the same time, it has also brought some problems, among which the dissemination of false health rumors is particularly prominent (Meel & Vishwakarma, 2020). As people's attention to health continues to increase, the demand for health information is also growing stronger. However, due to the openness of online social media and the high degree of user participation, anyone can post and forward health information without confirming its authenticity, which leads to a flood of health rumors of uncertain authenticity on the Internet (Massoudi & Sobolevskaia, 2021). For example, some self-media, in order to attract traffic, present false health rumors in multimodal forms such as pictures, images, short videos, and live streaming, and express them in the form of stories, which are more deceptive and inducing (Sun et al., 2024). After believing false information by mistake, the audience is prone to make wrong judgments and take irrational or even wrong actions, such as forwarding this information, so that false health rumors can be spread a second time, leading to serious consequences. Therefore, studying the impact of social media dependency on netizens' forwarding of health rumors and the role of social media literacy therein has important practical significance.

2. Literature Review

Health rumors on social media are unconfirmed information that can spread rapidly and have significant consequences (Oh & Lee, 2019). The forwarding behavior of health rumors is an active information giving (Kim & Grunig, 2011), which is influenced by many factors. Some studies have shown that rumor characteristics such as the content of the rumor and the credibility of its source significantly affect the willingness to forward rumors (Seah & Weimann, 2020). For example, if a rumor is packaged under the guise of pseudoscience, it can lead to the confusion and panic of patients and then be spread (Wang et al., 2023); some studies have shown that audience psychological factors, such as altruistic motives (Seah & Weimann, 2020), anxiety and panic (Tian et al., 2022), cognitive biases or superstitious beliefs (Que et al., 2020), also affect their judgement and forwarding behavior of health rumors; some studies have shown that factors related to social environment, such as in the era of information explosion, the lack of effective information screening and verification mechanisms makes it easier for health rumors to be mixed in and spread (Li & Sakamoto, 2015). The herd phenomenon in the social environment also affects an individual's forwarding behavior. If people around are

spreading a certain rumor, an individual may be more likely to be influenced and participate in forwarding (DeMers, 2007). Some other studies have pointed out that the effectiveness of the government and other authoritative institutions in dealing with the spread of health rumors has an impact on the public's forwarding behavior (Seah & Weimann, 2020).

In summary, the forwarding behavior of health rumors is comprehensively affected by multiple factors, including the characteristics of the rumor itself, the psychological factors of the audience, the social environment, and factors related to information dissemination. However, the mechanism of how netizens' social media dependency and social media literacy affect the forwarding behavior of health rumors has not yet been involved. The widespread use of social media has made people's dependence on them deepen continuously, affecting the frequency of netizens' exposure to health rumors and also possibly affecting their degree of trust in rumors. When seeing these rumors, due to the lack of sufficient discrimination ability and critical thinking, they are more likely to forward them without verifying their authenticity. This article aims to explore the relationship between social media dependency, media literacy, and the willingness of forwarding health rumors, and provide a basis for controlling the spread of false health information.

3. Theoretical Basis and Research Hypothesis

2.1 Media Dependency Theory

The theory of media dependency provides a framework for understanding how audiences rely on media systems to meet their information, social interaction, and entertainment needs (Ball-Rokeach & DeFleur, 1976). Currently, social media has evolved over the past decade to become a vital channel for the public to obtain and disseminate information across various domains (Stieglitz et al., 2018). People who rely on social media are more likely to believe in health rumors (Wu et al., 2023). Excessive reliance on social media can intensify individuals' health anxiety and fatigue, thereby influencing their propensity to forward health misinformation (Wu & Pei, 2022). On the basis of the above analysis, the following hypothesis is proposed:

H1. Social media dependency (SMD) is positively correlated with willingness to forward rumors (WRF). The higher the degree of dependence on social media, the stronger the willingness to forward.

2.2 Media Literacy Theory

In the era of new media, public media exposure, selection, use, evaluation, and utilization should be taken into account in the diffusion of rumors, which is termed media literacy(Li, 2017). It includes aspects such as information acquisition, interpretation, critical awareness of content, basic scientific literacy, and information discernment(Scott & Mumford, 2007). In the face of major public health events, if the public has a good media literacy, they can choose reasonable channels to access and interpret information, possess the ability to rationally discern the authenticity of information, and possess the ability to question passively accepting media influence, thus developing critical thinking and forming ‘antibodies’ against false information (Kuang & Wu, 2021). Therefore, media literacy is a factor that effectively inhibits the spread of rumors. On the basis of this, the following hypothesis is proposed:

H2. Netizens' social media literacy (SML) has a negative effect on the forwarding intention. The higher the literacy, the weaker the willingness to forward health rumors.

2.3 Information Processing Theory

Information processing theory posits that humans process the received information rather than simply reacting to stimuli (Gross, 2012). An individual's social media literacy (such as information evaluation ability) can moderate the information acquisition impulse brought by social media dependency during the information processing. When an individual's social media literacy is relatively high, when facing a large amount of information exposure caused by social media dependence, they will process the information more carefully, thereby weakening the positive driving effect of social media dependence on the forwarding intention. Based on this, the following hypotheses are proposed:

H3. Social media literacy will moderate the relationship between social media dependency and willingness to forward.

H4. As the level of netizens' social media literacy increases, the positive impact of social media dependency on their willingness to forward health rumors will weaken.

4. Method

4.1 Sample and Data Collection

The data collection of this study is a purely online survey and was conducted by a professional survey company named Questionnaire Star[1], which offers several advantages. It leverages a broad respondent network and advanced data collection technologies to ensure the representativeness of the sample and the accuracy of the data. Additionally, the

[1] https://www.wjx.cn/

company implements rigorous data quality control measures to effectively reduce data bias while ensuring efficiency and legal compliance throughout the collection process, thus enhancing the reliability and credibility of the research results.

The sampling method that it used is simple random sampling. A total of 429 questionnaires were collected, of which 412 were valid and 17 were invalid, achieving a valid response rate of 96.03%. The number of valid questionnaires meets the sample size requirements for this study, ensuring the reliability and representativeness of the analysis results. The research utilizes SPSS for data analysis to validate the research hypotheses.

4.2 Measures

After an extensive review of the literature, mature scales widely recognized by the academic community were selected. The instrument is shown in Table 1. The level of social media dependency is measured by nine items (Liu, 2013). Social media literacy is measured by six items (Li, 2017), and willingness to forward health rumors is measured by three items (Lv et al., 2020). The content of the health information was chosen from the China Internet Joint Rumor-Refuting Platform, which is hosted by the China Cyberspace Administration. That is, "The latest discovery in the journal 'Nature' indicates that sleeping with wet hair can cause a carcinogenic microorganism called 'Malassezia' to proliferate on the scalp, significantly increasing the risk of cancer."[2] This piece of information was relatively widespread. Later, it was officially refuted and confirmed to be false.

Table 1. The instrument scale

Constructs	Items	
SMD	SMD 1	Continuously refreshing social media, anticipating new “messages”, “@” or “direct messages”.
	SMD 2	Always wanting to open social media, finding it difficult to control the time spent logging into social media.
	SMD 3	Spending much more time on social media than expected.
	SMD 4	Noticing that using social media does not bring enjoyment or satisfaction yet finding it hard to stop.
	SMD 5	Attempting to reduce social media usage, but not achieving noticeable results.
	SMD 6	Feel uncomfortable, restless, or anxious when unable to use social media.
	SMD 7	Often temporarily interrupting ongoing studies or work to use social media.
	SMD 8	Using social media as a way to escape real-life tasks and alleviate negative emotions.
	SMD 9	Frequently procrastinating or interrupting scheduled activities due to social media usage.
SML	SML 1	I am able to obtain sufficient and useful media information for my daily life and studies.
	SML 2	I can assess the credibility of social media information by seeking corroborating evidence.
	SML 3	I am able to assess the credibility of social media information based on factors such as headlines, content, etc.
	SML 4	I can determine whether the information on social media states facts or expresses opinions.
	SML 5	I am capable of evaluating the potential impact of social media information content on others or society.
	SML 6	I can assess the credibility of the information by the authority of the information publishing agency.
WRF	RFW 1	I want to forward this message, not just read it.
	RFW 2	I want to forward this message, not just read it.
	RFW 3	I want to forward this message, not just read it.

[2] http://www.piyao.org.cn/

5. Results

5.1 Reliability Analysis

Regarding reliability analysis, there are a number of different aspects of reliability. One of the main issues concerns internal consistency. In the current study, the Cronbach alpha coefficient is shown in Table 2, which are above 0.8, indicating has good internal consistency.

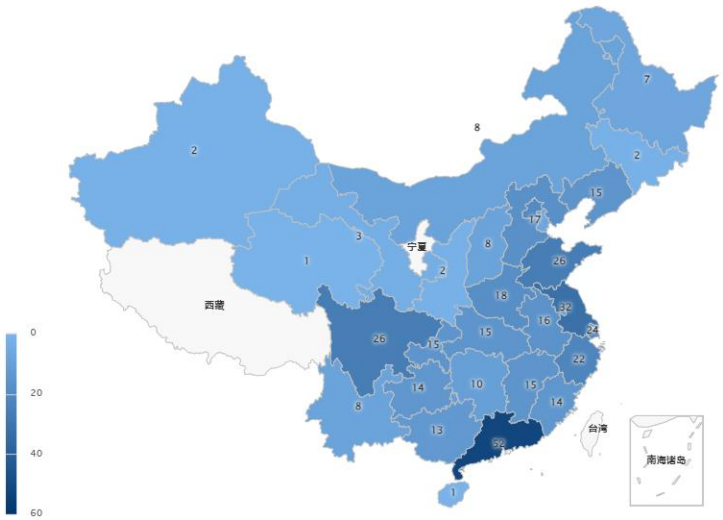
Table 2. Reliability statistics

	Items No	Cronbach's Alpha
SMD	9	0.901
SML	6	0.941
WRF	3	0.997

5.2 Description Statistical Analysis

The respondents in this study were from 30 provincial administrative regions in mainland China. As shown in Figure 1, with the exception of Tibet and Ningxia, all other 30 provinces were represented, achieving a coverage rate of 93.75%.

Figure 1. The distribution of respondents



As shown in Table 3, of the 412 valid questionnaires, 36.56% of the respondents were male and 63.44% were female. Most of respondents were between the ages of 31 and 40, representing 52.4% of the sample, followed by those between the ages of 18 and 30, which comprised 36.9%. Together, these two age groups represent nearly 90% of the total sample. In contrast, respondents aged 41 to 50 and 51 to 60 accounted for a smaller proportion, at 8% and 2.7%, respectively. The sample is predominantly concentrated in the younger and middle age groups, which is consistent with the age distribution trends of social media users in China.

In terms of education level, most of the respondents held a bachelor's degree, accounting for 88.62% of the sample, followed by those with a master's degree or higher at 5.08%. Fewer respondents had a high school/technical secondary school education or a junior high school education, representing 6.05% and 0.24% of the sample, respectively. There were no respondents with an elementary education or lower.

Regarding the occupational distribution, the respondents were mainly employed in management roles, such as Administration, Human Resources, Business Managers and Party and Government Organizations, representing 38.1% of the sample. The next largest group was those working in production and technology fields, such as Product/Operations Personnel and Technology Development/Engineers, accounting for 20.4%. Corporate managers, marketing/sales/business personnel, and product/operations personnel were the main occupational groups in the survey sample, while the proportion of procurement, legal professionals, designers, and similar occupations was relatively low.

Regarding preferences for obtaining health information from social media, microblogging platforms like Weibo, Douyin, and Kuaishou were the most popular, with 90.07% of respondents using them. Instant messaging platforms such as

WeChat and QQ were also popular, with 81.84% of respondents using them, followed by knowledge sharing and experience-exchange platforms such as Xiaohongshu and Zhihu at 79.9%. In contrast, video livestreaming platforms such as Huya and Douyu were less popular, with only 34.38% of respondents using them. This indicates that respondents prefer to obtain health information from microblogging, instant messaging, and knowledge sharing platforms, with a particularly strong preference for microblogging platforms.

Table 3. Demographic characteristics of the respondents

Demographics		**Frequency**	**Percentage (%)**
Gender	Male	151	36.7
	Female	261	63.3
Age	18-30	152	36.9
	31-40	216	52.4
	41-50	33	8
	51-60	11	2.7
Education	Junior school	1	2
	High school or associate degree	25	6.1
	Bachelor's degree	365	88.6
	Master's degree and above	21	5.1
Occupation	Management and Administration	157	38.1
	Sales and Marketing	56	13.6
	Finance and Legal	36	8.7
	Production and Technology	84	20.4
	Professional Services	31	7.5
	Self-Employed and Freelancers	29	7.0
	Special Status	19	4.6
Preference	Microblogging social media	372	90.07
	Social media instant messaging platforms.	338	81.84
	Knowledge sharing and experience exchange on social media platforms.	330	79.9
	Live streaming social media platforms.	142	34.38

5.3 Hypothesis Testing Analysis

The study explored the relationships between variables using Pearson's correlation analysis. The results are shown in Table 4, which indicates that the correlation coefficient between **SMD** and forwarding intention is **0.428**, showing a moderate positive correlation, indicating that an increase in **SMD** is associated with an increase in forwarding willingness. The correlation coefficient for **SML** is **-0.504**, reflecting a significant negative correlation, which means that increases in **SML** are related to decreases in forwarding willingness. Finally, the correlation coefficient between **SMD** and SML is **-0.234**, showing a negative correlation, indicating that an increase in **SML** is associated with a decrease in SMD. These correlation results provide valuable information on the relationships between variables and lay the basis for subsequent regression analysis.

Table 4. The results of correlation analysis

	Pearson Correlation	SMD	SML	IF
SMD		1	-.234**	.428**
SML			1	-.504**
WRF				1

**. The correlation is significant at the 0.01 level (2-tailed).

The study conducts regression analysis, using linear regression method to examine the effect of independent variables on the dependent variable "willingness to forward". As shown in Table 5, the unstandardized coefficient of the SMD variable is 0.379 ($p < 0.001$), which indicates that SMD has a significant positive effect on "willingness to forward", and its standardized coefficient (Beta = 0.328) also demonstrates this positive contribution, thus hypothesis H1 is established. The unstandardized coefficient of the SML variable is -0.539 ($p < 0.001$), meaning that SML has a significant negative effect on the 'willingness to forward", and the standardized coefficient (Beta = -0.428) also illustrates this negative contribution, so hypothesis H2 is established.

Table 5. Results of the linear regression coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	4.244	.285		14.915	.000
SMD	.379	.047	.328	8.052	.000
SML	-.539	.051	-.428	-10.483	.000

a. Dependent variable: WRF

Table 6. Results of the linear regression coefficients[a]

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.232	.896		2.491	.013
SMD	.923	.235	.801	3.930	.000
SML	-.037	.218	-.029	-.168	.867
DL	-.137	.058	-.550	-2.365	.018

a. Dependent variable: WRF

Finally, the results of the linear regression including the interaction term of SMD and SML, represented by DL, are shown in Table 6. It further verifies the significant positive effect on the "willingness to advance" ($B = 0.923$, $p = 0.000$), while SML' effect is not significant in this model ($B = -0.037$, $p = 0.867$). However, the negative and significant coefficient of DL ($B = -0.137$, $p = 0.018$, Beta = -0.550) clearly indicates that SML indeed moderates the relationship between SMD and the willingness to forward. As the SML level changes, the influence of SMD on the willingness to forward is no longer a simple linear positive correlation. A higher SML may weaken the positive promoting effect of SMD on willingness to forward or even lead to a negative change, which is consistent with the proposed hypothesis of H3, that is, social media literacy moderates the relationship between social media dependence and willingness to forward.

For H4, its hypothesis is that as the level of social media literacy (SML) increases, the positive effect of social media dependence on their willingness to forward health rumors will weaken. This is consistent with our analysis results. When SML is considered alone, it has a significant negative effect on the willingness to forward (-0.539, $p < 0.001$). Although the individual effect of SML becomes insignificant in the model containing the interaction term, the significant negative result of the interaction term DL means that with increasing SML, in the combined effect with SMD, the positive effect of SMD on the willingness to forward is weakened. When netizens have a higher level of social media literacy, they will be more rational in processing information, have stronger discrimination and critical thinking abilities for the content on social media, thus reducing the possibility of blindly forwarding only due to social media dependence, resulting in the weakening of the positive effect of social media dependence on the willingness to forward, thus verifying H4.

6. Discussions

This paper explores the impact of SMD on netizens' willingness to forward health rumors, as well as the moderating role of SML. The results indicate that there are close and complex relationships among these three variables.

In terms of sample characteristics, the extensive geographic coverage and rich demographic information provide a comprehensive perspective for the study. The age is concentrated in the young and middle-aged groups, which are the main users of social media. This is in line with the user profile of social media and also makes the research results more

capable of reflecting the real situation in the social media environment. The relatively large proportion of highly educated people can affect their ways of processing information and their judgment ability about health rumors. Distribution of different occupations also implies that people with different work backgrounds may have differences in the use and information dissemination. Investigation of social media usage preferences further reveals the characteristics and audience tendencies of different platforms in the dissemination of health information, providing important clues for understanding the dissemination channels of health rumors.

All research hypotheses have been verified. The correlation analysis clearly shows the positive correlation between SMD and WRF, the negative correlation between SML and WRF, and the negative correlation between SMD and SML. This means that the higher the degree of social media dependence, the stronger the willingness to forward health rumors, while the higher the social media literacy, the lower the willingness to forward, and a higher social media literacy can reduce the degree of social media dependence. The regression analysis further confirms the significant positive effect of SMD on forwarding willingness and the significant negative effect of SML. More importantly, through the analysis including the interaction term, the moderating role of SML in the relationship between SMD and WRF is clarified. When the level of SML changes, the impact of SMD on WRF is no longer a simple linear relationship, and a high SML will weaken the positive promoting effect of SMD on the forwarding willingness, which is completely consistent with our proposed hypotheses and also provides profound insights into information dissemination and user behavior in the social media environment.

Regarding the reason why SML has a significant negative effect on willingness to forward when considered alone, but its individual effect becomes insignificant in the model containing the interaction term, as shown in Table 5, the correlation coefficient between SMD and SML is -0.234, which to some extent explains why the effect of SML on the willingness to forward is not significant after adding the interaction term. This negative correlation may cause the model to have a multicollinearity problem, so that the individual effect of SML is "absorbed" or "confused" by the interaction term and the SMD variable. After adding the interaction term, the structure and variable relationships of the model change, and it focuses more on capturing the combined effect of SMD, SML and their interaction term. The direct effect of SML alone on the willingness to forward is weakened in this complex structure. At the same time, the explanatory power of the model is redistributed among the variables. The interaction term DL may "seize" part of the ability that was originally explained by SML alone for the willingness to forward, resulting in the insignificance of the individual coefficient of SML, while the interaction term DL undertakes part of the comprehensive explanatory responsibility for the willingness to forward.

Theoretical significance: This study, from the perspectives of SMD and SML, explores its impact on the willingness to forward health rumors, enriching the research content in the field of the dissemination of social media information. Previous studies may have focused more on the characteristics of the information itself or the dissemination channels (Seah & Weimann, 2020), as well as audience psychological factors(Tian et al., 2022), etc. While this study focuses on the individual characteristics and behavioral tendencies of users, revealing the psychological and behavioral mechanisms of users in the social media environment and providing a new theoretical perspective for further understanding how information diffuses in social media.

Practical significance: Firstly, it provides guidance for the management of social media platforms. On the basis of the research results, platform managers can formulate more targeted management strategies. On the one hand, strengthen the review and supervision of platform information, especially information related to the health field, timely discover and handle false rumors to reduce the source of their dissemination. On the other hand, through conducting user education activities, improve users' social media literacy, such as holding online training courses, pushing information identification skills, etc., guide users to use social media rationally, enhance their ability to distinguish health rumors, and thus create a healthy and orderly social media environment. Secondly, improve the public's awareness of preventing health rumors. Research conclusions remind the public to be aware of the possible risks that social media dependence, be vigilant when browsing and forwarding information, and use critical thinking to analyze and judge the information. The public can improve their health literacy and information discrimination ability by actively learning health knowledge and following official authoritative channels, avoid becoming the disseminators of health rumors, and thus protect their own and others' health rights and interests.

7. Conclusions

This article, through empirical research, has explored the relationships among social media dependence, media literacy, and the forwarding of health rumors. The study has found that social media dependence, to a certain extent, will promote the forwarding of health rumors. Meanwhile, media literacy plays a crucial moderating role in this process. This provides a theoretical basis and practical guidance for better understanding the mechanism of the dissemination of false health information and for effectively controlling the spread of false health information on online social media.

Certainly, this study has mainly focused on the relationships among these three variables, but in the actual social media environment, there may be many other factors that affect users' forwarding behavior. For example, factors such as personal interests and hobbies, psychological demands, values, and social relationship networks may have an impact on the willingness to forward health rumors. Further in-depth research will be carried out in the future.

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Authors contributions

YLL: Contributed to the conception, design, and writing of the entire manuscript. Led the data collection, analysis and interpretation of the literature included in this review. Responsible for drafting and revising the manuscript. EM: Provided significant guidance and feedback throughout the manuscript preparation. Reviewed critically reviewed the manuscript for important intellectual content. AAA: Contributed to the critical review of the manuscript and provided academic supervision. Offer valuable insights and suggestions to enhance the quality of the work. All authors read and approved of the final manuscript.

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