A Quantitative Study on Health Information Dissemination Through the We-Media Platform Among Middle-Aged and Elderly Users

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Abstract: The dissemination of health information through the we-media platform among middle-aged and elderly users is a critical topic of research. Based on the technology acceptance model (TAM) and in combination with the characteristics of health we-media, this paper investigated the current trend of middle-aged and elderly groups using the we-media platform to obtain health information and the factors influencing their acceptance. The results revealed that the perceived ease of use and usefulness of the platform is considerably affected by the following: (1) age groups; (2) the trust of the users in the we-media platform; (3) the technical difficulty of the we-media platform. Moreover, acceptance willingness depends on the professional level, difficulty of use, and technology. Furthermore, both perceived ease of use and perceived usefulness of middle-aged and elderly users positively affects their acceptance willingness. Therefore, the we-media platform needs to continuously improve the user experience and improve the acceptance willingness of middle-aged and elderly user groups. This paper will be beneficial to enrich the modern life research of middle-aged and elderly groups, and provide reference for the further improvement of we media platform.

1 INTRODUCTION

China is a country with a considerable elderly population. Therefore, population aging and health literacy of elderly groups are critical concerns. The Internet age has ushered numerous dissemination channels, which can rapidly propagate health information. Therefore, in the current information era, how middle-aged and elderly groups obtain and distinguish health knowledge is a critical topic of research. The all-weather, diversified, and low-cost information dissemination in the Internet age has resulted in considerable health information becoming available. However, middle-aged and elderly groups cannot discern the authenticity of such information. Therefore, identifying crucial health information is key to improving their health literacy among middle-aged and elderly groups.

Communication of health knowledge among middle-aged and elderly groups is essential. However, people of such age groups do not easily accept new media, with some elderly people refusing to use we-media platforms such as Tik Tok, SnackVideo, and WeChat. Therefore, producing truthful and misleading information, fine content, and attracting the attention of middle-aged and elderly groups mainly by service are problems created by health science we-media. The current communication strength of health science we-media among middle-aged and elderly groups, their communication characteristics, and typical problems in health science short videos were discussed. This paper investigated the optimal communication path of health science short videos to improve the health literacy of middle-aged and elderly groups and provided support for building a healthy ageing society.

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2 LITERATURE REVIEW

2.1 Health Communication On We-Media

Reviewing the existing achievements of health communication under the background of new media technology, it is found that China's health communication we media platforms include wechat, Tiktok and microblog. Most studies focus on the environmental analysis of new media technology and current health communication. Most health communication strategies under new media technology focus on narrative strategies and communication methods. The most common method is to use specific self media short videos for case studies. Bai Jingjing analyzes the difficulties of healthy communication in the social media environment and believes that the concept innovation and paradigm transformation from one-way publicity to two-way dialogue are very important. In addition, this means the transformation from information flow to well connected networks and from community of interests to community of values (Hu, 2012). Hai min analyzed the impact of WeChat official account "DXY", and summarized the communication strategies of title, title production, topic selection, content subdivision and user interaction (Li, Zheng, 2020). Most health communication studies analyze public health emergencies. Jing and Li show the advantages of 2019 coronavirus disease transmission and effectively visualize, simplify and logic information (Bai, Wu, 2020). Mr. Xi put forward three common misunderstandings in the content construction of health science short films: non professional communicators mislead the audience and distort the facts; The content is rough and limited; Excessive commercialization of entertainment leads to the reduction of public services (Chen, 2021).

2.2 Health Communication Research on Middle-Aged and Elderly Groups

Li performed surveys using a questionnaire and in-depth interviews of retirees in Chunfeng community, Niujie, Beijing to analyse the spreading and current trends of health rumours among retirees. The characteristics of the spread of health rumours among retirees are as follows: information can be obtained in numerous method; however, most information is false; the arrival rate of effective information is low and information typically changes; retirees have low information literacy and different media contact habits. Furthermore, they revealed that the authorities can play a vital role in preventing and refuting rumours and improve awareness among retirees (Li, 2021).

Foreign studies on the health communication among middle-aged and elderly groups have mainly focused on conventional and social media. Andersen, Medagalia, and Henriksen conducted a sampling survey on the middle-aged and elderly people from China and revealed that the use of conventional media, digital access, and social media considerably affects their social participation (Andersen, Medaglia, et al, 2012). Most studies have analysed the effect of social media on the executive functions of middle-aged and elderly groups from the effect dimension. Tao et al. performed structural equation model analysis to reveal that the use of social media by middle-aged and elderly groups can prevent cognitive decline (He, Huang, et al, 2020).

2.3 Studies on Health Communication Short Videos

Reviewing existing studies revealed that most domestic studies on health short videos have used the qualitative research method focused on content analysis. Most studies have focused on effects, such as communication mode, communication subject, and communication content, resulting from short videos to identify problems in existing health short video communication, and recommendations for the development of the platform. Liru investigated changes that new media, such as Tik Tok short videos, has ushered in health communication and revealed that Tik Tok short videos provided considerable information supply for health communication, eased the doctor–patient relationship, and guided the public to maintain a healthy mentality[]. Kexian evaluated the forwarding behaviour of Tik Tok health short video users and the factors affecting their forwarding in the context of health communication and summarised influencing factors as follows: perception of content quality, information relevance, trust mechanism, opinions link, social motive, and motive for persuasion (Zhang, 2021).

3 HYPOTHESES

The technology acceptance model (TAM) based on Ajzen's theory of reasoned action (TRA) was first proposed by DAVIS in 1986. The two primary

determinants of the TAM, namely perceived usefulness and perceived ease of use, are used to verify the acceptance of the information system by the users. The perceived ease of use refers to the degree to which users believe a technology can reduce effort by using the system, and perceived usefulness refers to the degree to which users believe a technology can improve their work efficiency when using the system. According to the TAM, external variables considerably affect the perceived ease of use, which can indirectly affect the behavioural intention of users. Both perceived ease of use and perceived usefulness determine the desire of users to use the technology. Furthermore, behavioural intention determines their actual use behaviour. The TAM developed by DAVIS is displayed in Fig. 1.
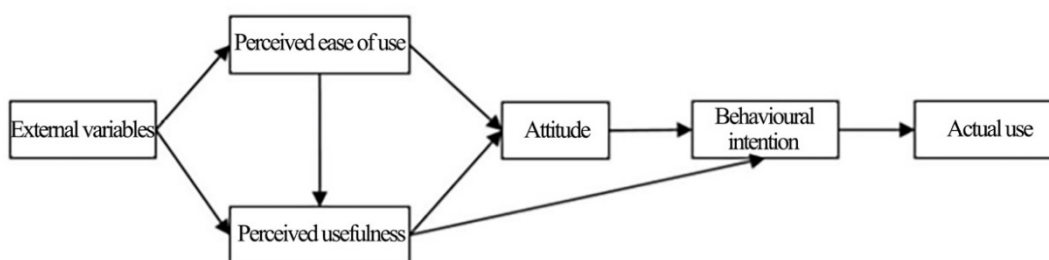

Figure 1: Technology acceptance model (TAM).

Based on the TAM, this study proposed the following 18 hypotheses through analyses of the health we-media platforms and trend of middle-aged and elderly users.

3.1 Trends of Middle-Aged and Elderly Users and the TAM

This study investigated the trend of middle-aged and elderly users from the perspective of age, level of education, and health literacy, which considerably affects the perceived ease of use and perceived usefulness in the TAM. The perceived ease of use primarily includes three aspects, namely the difficulty of use, information quality, and level of service. Perceived usefulness covers three aspects, namely the efficiency of obtaining information, convenience of obtaining information, and accuracy of information. Based on this data, we proposed the following five specific hypotheses from two directions, that is, users' own situation positively affects their perceived ease of use and perceived usefulness.

3.1.1 Positive Effects of the Situation of Middle-Aged and Elderly Users on Their Perceived Ease of Use

2 specific hypotheses related to this hypotheses are as follows:

H1: the education level of middle-aged and elderly groups considerably affects their ability to identify the truth of health knowledge. The middle-aged and elderly with higher education could easily distinguish between real and fake health knowledge.

H2: Considerable differences exists between the middle-aged and elderly people who have accessed health information on the Internet and those who have not. Those who have seen health science information on we-media platforms are more likely to identify health rumours than those who have not.

3.1.2 the Situation of Middle-Aged and Elderly Users Positively Affects Their Perceived Usefulness

3 specific hypotheses related to this hypotheses are as follows:

H3: the age of middle-aged and elderly groups considerably affects their acceptance of health science we-media. The younger the middle-aged and elderly users are, the more likely they are to accept health science we-media.

H4: the gender of middle-aged and elderly groups considerably affects their acceptance of health science we-media. Middle-aged and elderly women are more willing to actively search for health science knowledge in comparison with men.

H5: the health literacy of middle-aged and elderly groups considerably affects their acceptance of health science we-media. The higher the health literacy level is, the more willing they are to accept health science we-media.

3.2 Characteristics of Health Science We-Media and the TAM

Numerous short video platforms and channels have emerged for health communication. People can access various health information through media. This access is an opportunity and a challenge for we-media and the health communication industry. However, verifying the truth of such health information is difficult. Currently, health we-media are characterised by various professional levels, considerable difference in user traffic and diversified platforms. Therefore, the following eight hypotheses were proposed from two perspectives: the trust of middle-aged and elderly users in we-media platform positively affected their perceived ease of use and perceived usefulness; the technical difficulty of health we-media had a negative effect on perceived ease of use and perceived usefulness of users.

3.2.1 the Trust of Middle-Aged and Elderly Users in We-Media Platform Has a Positive Impact on Their Perceived Usefulness

3 specific hypotheses related to this hypotheses are as follows:

H6: the wardrobe, props, and makeup of we-media platform professionals considerably affects the acceptance of middle-aged and elderly users. These professionals are more willing to trust short bloggers who are good at medical care than the health science short bloggers with casual dressing.

H7: their trust in we-media accounts and mainstream media accounts: they are more willing to trust the health information released by the official mainstream media compared with that released by we-media bloggers.

H8: the number of followers of we-media accounts can considerably affect the trust of middle-aged and elderly users: they prefer to trust the we-media accounts with high number of followers compared with those with a small number of fans.

3.2.2 the Difficulty of Health Science We-Media Has a Positive Effect on Perceived Ease of Use

5 specific hypotheses related to this hypotheses are as follows:

H9: the popularity of we-media platforms considerably affects the acceptance of middle-aged and elderly users: compared with less popular we-media platforms, these are more prone to obtain health

information in platforms with popular platforms.

H10: the operating difficulty of we-media platforms can considerably affect the acceptance of middle-aged and elderly users: compared with we-media platforms that require reading text, they prefer to receive health information through short video platforms.

H11: the operating difficulty of we-media platforms can considerably affect the acceptance of middle-aged and elderly users: compared with the we-media platforms that require opening a VIP service to obtain content, middle-aged and elderly users are more likely to select the we-media platforms through which they can directly obtain health information.

H12: user interactive experience considerably affects the acceptance of middle-aged and elderly users: they prefer to obtain health information in the platforms with comment areas compared with the platforms without comment areas.

H13: user interactive experience considerably affects the acceptance of middle-aged and elderly users: compared with the platforms that cannot provide feedback, they are more willing to obtain health information in the we-media platforms that allow feedback on complaints.

3.3 TAM and Users' Willingness to Adopt

DAVIS in the TAM revealed that the want-to-use attitude and behavioural intention of users are determined by their perceived ease of use. Their perceived usefulness can affect their want-to-use attitude, whereas their want-to-use attitude directly affects the behavioural intention of users. Therefore, we proposed the following five hypotheses:

H14: the perceived ease of use positively affects the perceived usefulness.

H15: the perceived ease of use positively affects the want-to-use attitude of users.

H16: the perceived usefulness has a positive effect on the want-to-use attitude of users.

H17: the perceived ease of use considerably affect the behavioural intention of users.

H18: the want-to-use attitude of users considerably affects their behavioural intention.

4 MODEL SPECIFICATION

Based on the TAM developed by DAVIS, we developed a theoretical model of influencing factors of middle-aged and elderly groups in health we-media (see Fig. 2).
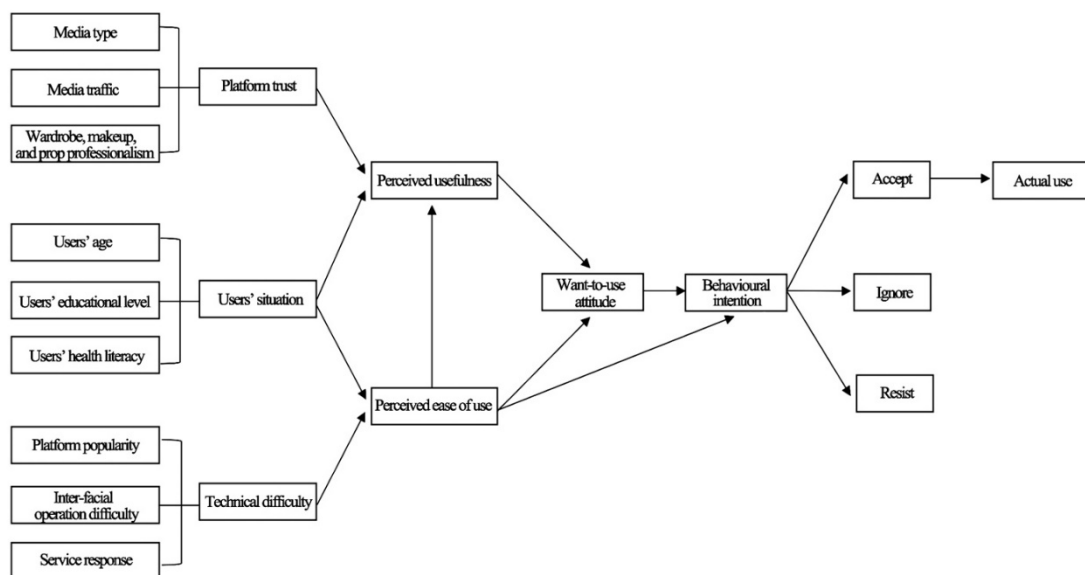
Figure 2: Theoretical model of influencing factors of middle-aged and elderly groups in health we-media.

We developed the original model of the willingness of middle-aged and elderly users to adopt health we-media in combination with the aforementioned model and hypotheses (see Fig. 3).
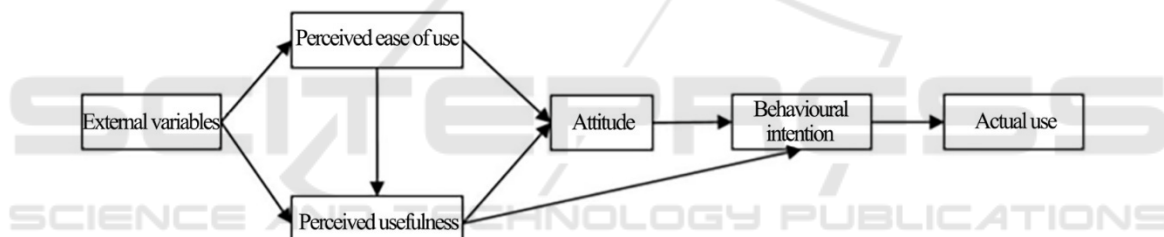

Figure 3: Original model of the willingness of middle-aged and elderly users to adopt health we-media.

5 METHOD

5.1 Questionnaire Design

The original questionnaire design was performed according to studies on the situation of middle-aged and elderly users and the characteristics of health we-media platforms and their information. Based on the TAM developed by DAVIS and Venkatesh's research on the TAM, we designed 10 questions to measure the perceived ease of use and the perceived usefulness. The questionnaire investigated the situation of middle-aged and elderly users from three directions, including their age, education level, and health literacy, for which we designed three relevant questions. Three relevant questions based on the two hypotheses that the trust of middle-aged and elderly users has a positive effect on perceived usefulness and perceived ease of users. The technical difficulty of the TAM was

performed according to Huaxiao and Li on the suitability framework analysis of smart care for the disabled elderly (Chen, Wang, 2021). Five questions are related to the popularity, operation difficulty, and service response of we-media platforms. We obtained the opinions of experts in the field of health and network to improve the professionalism of the questionnaire. The questionnaire was distributed for a pre-survey on a small scale and the content was adjusted in accordance with the feedback results to ensure that the language and terms used in the questionnaire can be comprehensible to the middle-aged and elderly users. Furthermore, the conceptual explanation of "health we-media" was added to facilitate further understanding of the questionnaire content; subsequently, the final questionnaire was distributed. All data collected from the simulated distribution were deleted. The questionnaire was designed with 28 measurement items including single

choice, fill-in-the-blank, five-point scale and ten-point scale.

5.2 Questionnaire Distribution and Data Collection

Of the 1076 questionnaires were collected in this survey. 1031 valid responses were obtained, with a valid questionnaire ratio of 95.8%, after deleting the invalid questionnaires that did not satisfy the research age requirements or answered the questionnaire in a short time. To ensure data accuracy, the results were obtained through two survey methods. First, 935 questionnaires were distributed through WJX on November 1, 2021, which were ended and counted on February 18, 2021. We performed the survey through leaving words for user comments on the WeChat official account, sending private messages to users who follow the health science we-media accounts on Tik Tok, SnackVideo, MicroBlog and Zhihu, consulting elderly relatives and friends through telephones, chat on WeChat and directing sending messages in the platform, so as to interview them about their use and opinions of health we-media. The resulting feedback was mainly in the form of telephone recordings and chat screenshots.

Among the 935 valid questionnaires distributed through WJX, 48.4% of respondents were men and 51.6% of respondents were female; the middle-age and elderly users with access to health information through the we-media platform were 80.9%. The respondents mainly graduated from high school and vocational technical institutes, and the main platforms they used are WeChat official account and Tik Tok (see Table 1 and Table 2).

Table 1: Information statistics of health science we-media users.

Classification	Options	Percentage
Gender	Male	47.7%
	Female	52.3%
Age	45~55	17.2%
	56~65	51.6%
	66~75	21.9%
	76~85	9.2%
	85 and above	0.1%
Education level	Have no systematic education	11.2%
	Primary education	21.3%
	Junior high school education	18.2%
	High school education	20.1%
	Vocational technical institute	17.5%
	College and above	11.7%
Health literacy	0~33 point	32.1%
	33~66 point	37.5%
	67~100 point	30.4%

Table 2: Information statistics of the middle-aged and elderly using health science we-media.

Classification	Options	%
Understanding level	Never heard of	9.8%
	Only heard of	12.3%
	Know a little bit	31.1%
	Know well	24.3%
	Know a lot about	22.5%
Frequency of use (videos)	Almost every day	23.0%
	Frequently	22.2%
	Generally	27.9%
	Occasionally	15.1%
	Never	11.8%
Frequency of use (non-videos)	Almost every day	21.1%
	Frequently	21.9%
	Generally	29.9%
	Occasionally	12.6%
	Never	14.5%

Based on the data collection results of the questionnaire, we used SPSS 26 to analyse the data from three aspects, that is, reliability and validity test, goodness-of-fit of the model and Pearson correlation, and finally verified whether the research hypotheses proposed in the present study are tenable.

6 EMPIRICAL ANALYSIS

6.1 Test of Validity

Cronbach's α was used to test the reliability of the scale. The results revealed that the α values of all variables are greater than 0.7, including users' situation, users' trust in the platform, technical difficulty of we-media platform, perceived ease of use, perceived usefulness, users' want-to-use attitude and their behavioural intention. This information indicates that each variable exhibits internal consistency (see Table 3).

Table 3: Cronbach's Alpha value of variables in the model.

Latent variables	Number of items	Cronbach's Alpha
Platform trust	3	0.767
Users' situation	5	0.778
Technical difficulty	7	0.808
Perceived ease of use	5	0.918
Perceived usefulness	5	0.918
Want-to-use attitude	3	0.869

Factor analysis and average variance extraction (AVE) were used to test the validity of the scale. The factor loads of all latent variables were greater than 0.7, and the AVE value of platform trust, users' situation, perceived ease of use, perceived usefulness, and users' want-to-use attitude were greater than 0.7. These results indicated that an excellent discriminant validity existed among variables. We adopt KMO and performed Bartlett's spherical test to test the data. As listed in Table 4, the research model exhibited discriminant validity.

Table 4: Correlation coefficient between the square root of AVE and latent variables.

Latent variables	AVE	Factor loads	KMO	Bartlett's spherical	df	P
Platform trust	0.656	0.794	0.722	2680.980	28	0.000
Users' situation	0.669	0.772	0.869	7331.473	171	0.000
Technical difficulty	0.638	0.743	0.828	10603.635	231	0.000
Perceived ease of use	0.753	0.868	0.901	3294.943	10	0.000
Perceived usefulness	0.754	0.868	0.903	3305.236	10	0.000
Want-to-use attitude	0.792	0.890	0.740	1429.017	3	0.000

6.2 Model Test

The factors influencing the want-to-use attitude of health we-media were analysed, and the results revealed that the loads of all variables in the rotational component matrix were greater than 0.7, and the cumulative variance explanation rate was 80.165%. Therefore, it is feasible to use perceived usefulness and perceived ease of use as the factors influencing users' want-to-use attitude toward health we-media. As presented in the factor analysis of the behavioural intention of health we-media, the loads of all variables in the rotational component matrix were higher than 0.8, and the cumulative variance explanation rate was 73.289%. This result indicates that want-to-use attitude can better explain the behavioural intention of middle-aged and elderly groups on health we-media (see Table 5).

Table 5: The rotational component matrix of want-to-use influence coefficient for health we-media.

Variables	Items	Factors
Perceived usefulness	Health science we-media can obtain health information quickly	0.867
	Health science we-media can obtain comprehensive health information	0.872
	Health science we-media can obtain accurate health information	0.903
	Health science we-media is more convenient for me to obtain the health information I need	0.891
	It is more reliable to obtain health information from health science we-media.	0.846
Perceived ease of use	It is easy for me to find a health science we-media account	0.806
	It is easy to find the health information I need	0.810
	The quality of information obtained by virtue of health we-media is higher than I expected	0.844
	The experience and gains of using health we-media are higher than I expected	0.875
	The service level of health we-media is higher than I expected	0.802
Attitude toward using	It is more convenient to use health we-media than other channels	0.882
	It is faster to use health we-media than other channels	0.834
	We can obtain more abundant information from health we-media than other channels.	0.889

We also analysed the four factors influencing the perceived ease of use and perceived usefulness, that is, perceived ease of use, perceived usefulness, want-to-use attitude, and behavioural intention, and regressive analysis was performed to sort out the paths between variables and obtain the correlation coefficient values between them (see Table 6). As listed in Table 6, the correlation coefficients between perceived ease of use and users' situation and technical difficulty are separately 0.802 and −0.645, respectively, and the correlation coefficients between perceived usefulness and users' situation, and platform trust are 0.771 and 0.847. The correlation coefficients between want-to-use attitude and perceived ease of use, and perceived usefulness were 0.693 and 0.741, and the correlation coefficients between behavioural intention and perceived ease of use and want-to-use attitude were 0.686 and 0.791. The data revealed that the perceived ease of use positively affected perceived usefulness; both perceived ease of use and perceived usefulness exhibited a positive effect on users' want-to-use attitude, and perceived ease of use and want-to-use attitude have a positive effect on users' behavioural intention (see Table 7). The present research results based on the TAM are further verified.

Table 6: Standardised path coefficients and test values of the modified model.

Hypotheses	Paths	Correlation coefficients	P
H1, H2	Users' situation - perceived usefulness	0.771	<0.01
H3, H4, H5	Users' situation - perceived ease of use	0.802	<0.01
H6, H7, H8	Platform trust - perceived usefulness	0.847	<0.01
H9, H10, H11, H12, H13	Technical difficulty - perceived ease of use	−0.645	<0.01
H14	Perceived ease of use - perceived usefulness	0.681	<0.01
H15	Perceived ease of use - want-to-use attitude	0.693	<0.01
H16	Perceived usefulness - perceived usefulness	0.741	<0.01
H17	Perceived ease of use - behavioural intention	0.686	<0.01
H18	Want-to-use attitude - behavioural intention	0.791	<0.01

Table 7: Results summary of hypotheses testing.

No.	Research hypotheses	Meet the test	Fail the test
H1a	The own situation of middle-aged and elderly users has a positive impact on their perceived ease of use	✓	
H1b	The own situation of middle-aged and elderly users has a positive impact on their perceived usefulness	✓	
H2	The trust of middle-aged and elderly users on we-media platform has a positive impact on their perceived usefulness	✓	
H3	The using difficulty of health science we-media has a negative impact on users' perceived ease of use	✓	
H4	Perceived ease of use has a positive impact on perceived usefulness	✓	
H5	Perceived ease of use has a positive impact on users' want-to-use attitude	✓	
H6	Perceived usefulness has a positive impact on users' want-to-use attitude	✓	
H7	Perceived ease of use has a positive impact on users' behavioural intention	✓	

7 CONCLUSION AND ENLIGHTENMENT

7.1 Conclusions and Analyses

The present study investigated the adoption model of middle-age and elderly users of health we-media, and a questionnaire survey was conducted in accordance with the three factors influencing user experience. Finally, the research hypotheses and theoretical model were verified through data analysis and empirical research.

The main conclusions are as follows. Analyses of information regarding the middle-aged and elderly groups and health we-media revealed that older users exhibit a low acceptance health we-media; furthermore, users with lower education exhibit a low acceptance rate of health information obtained from health we-media.

The operating difficulty of we-media platform negatively affects the perceived ease of use,

indicating that the simple the operation interface and the more convenient the use of we-media are, the more favoured the middle-aged and elderly users favour the platform. Data analysis revealed that middle-aged and elderly users are willing to accept and use video we-media (e.g., Tik Tok, SnackVideo, and WeChat video) more frequently than we-media in the form of picture and texts (e.g., WeChat official account, MicroBlog and Zhihu), among which Tik Tok short video exhibited the highest acceptance and frequency of use.

The trust of middle-aged and elderly users in health we-media (the professionalism of health we-media) positively affects their perceived usefulness. This result indicates that the we-media account with more professional scene building, wardrobe props, and literal use results in middle-aged and elderly users to have a positive attitude toward them.

Both perceived ease of use and perceived usefulness exhibited a positive effect on want-to-use attitude of middle-aged and elderly users. Their perceived ease of use considerably affects their want-to-use attitude. This result revealed that the simpler the operation of health we-media is, the more convenient the access channels, the higher the acceptance of middle-aged and elderly users are. The higher the accuracy and professionalism of health information are in we-media account, the higher the recognition of middle-aged and elderly users are.

The want-to-use attitude of middle-aged and elderly users towards we-media platform has a positive effect on their use behaviour. As displayed by the results of empirical research, the more middle-aged and elderly users want to use health we-media, the more likely they are to use health information obtained from health we-media in their daily life.

7.2 Enlightenment and Limitations

Based on the above conclusions, we proposed the following suggestions for we-media platforms and health we-media accounts from the perspective of technical difficulty and professionalism. We-media platform owners should consider the requirements of the middle-aged and elderly users in the design of interface, simplifying the operation difficulty of the platform so that they can directly obtain health information without asking for help. To ensure the truth and accuracy of health information, we-media owners should reinforce user trust by improving shooting environment and the professionalism of wardrobe, makeup, and props.

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