

Strategies to Enhance Health Communication Participation Among Medical Students in Chinese Universities: A Cross-Sectional Study

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Purpose: Health communication is the central social process that refers to the systematic dissemination of evidence-based health information to improve public health literacy and promote healthy behaviors. Medical students' participation in health communication is an effective way to improve public health. This study aimed to explore the current status and influencing factors of medical students' participation in health communication and offer specific suggestions.

Methods: In this cross-sectional study, an online self-designed questionnaire was distributed to medical students during August 2022 to September 2022. Group differences were assessed using the Chi-square test and the Fisher-Freeman-Halton exact test.

Results: A total of 314 medical students participated in the survey. The respondents demonstrate a high awareness regarding the importance of health communication. The top two public platforms for students to acquire and disseminate knowledge are WeChat public accounts and short video platforms. 66.56% (209/314) of respondents have participated in health communication. Among undergraduates, the primary barrier to participation is a lack of sufficient professional knowledge and clinical experience ($\chi^2 = 9.317$, $P = 0.002$). For postgraduate students, a lack of time due to heavy academic load ($\chi^2 = 11.17$, $P = 0.001$) was the main impediment. Notably, 97.13% of students express a willingness to improve their health communication abilities by participating in activities such as lecture training, studying excellent works and joining clubs or organizations.

Conclusion: The respondents agree on the critical role of medical students in disseminating health science knowledge, but their engagement level needs to be improved. Medical students' health communication ability and participation require collaborative efforts from multiple parties.

Keywords: medical students, health communication, health promotion, cross-sectional study

Introduction

Health communication refers to the accurate and transparent dissemination of scientifically validated medical and health information to the public,¹ which is a basic and critical step to improve the health level of the entire population,² and achieve public health equity.³ Common forms include health education lectures, public service announcements, social media campaigns, community outreach activities, health columns in newspapers or online platforms, short-form videos on digital media (eg, TikTok or WeChat), and interactive science communication events in schools or communities. Promoting medical students to establish health concepts and master health knowledge can effectively prevent diseases, promote health, and improve quality of life. The Healthy China 2030 Planning Outline points out that the strategic theme of building a healthy China is co-construction and co-sharing.⁴ Therefore, it is necessary to build a health-centered construction and promote



healthy lifestyles, to reduce the occurrence of diseases from the prevention stage and achieve better health. A high level of national health requires continuous improvement of the health service system.⁵ From implementing correct infection prevention measures during the Coronavirus Disease 2019 (COVID-19) pandemic to raising awareness about chronic disease management, health communication permeates many aspects of daily life. After the COVID-19 pandemic, people are paying more attention to medicine and health,⁶ and their demand for health communication is gradually increasing.⁷ Bringing science to the general public enables people to be informed about potentially dangerous misconceptions and counter misinformation from various lobbies,⁸ which is particularly important to diseases that have a direct impact on future generations.⁹

Effective communication is essential to establish a good doctor–patient relationship and practice high-quality medicine,¹⁰ so doctors must learn and practice communication skills from their school days. Participation in health communication activities not only can help medical students deepen their understanding of professional knowledge and enhance their learning motivation, but also provide them with a role change, understanding the disease from the patient’s perspective, enhancing their doctor-patient communication skills and capabilities. It was reported that the stronger the students’ willingness to participate in health science communication, the stronger the sense of achievement they will have.¹¹ While health communication has gained increasing attention, especially after the COVID-19 pandemic, it remains underrepresented in Chinese medical education. Formal training and institutional support are limited, and most related activities are extracurricular. Moreover, there is little empirical data on how medical students perceive their roles and preparedness in this area.

Given the growing importance of health communication as a core professional competency for physicians, and the unique position of medical students as future healthcare providers, this study aims to address the existing gap by examining their attitudes and identifying barriers to their engagement in health communication. We selected medical students as our research subjects to conduct this cross-school and cross-grade survey, analyse the influencing factors and existing obstacles of medical students’ participation in health communication, putting forward suggestions from four aspects: students themselves, platform guidance, school support, and teachers’ instruction to improve medical students’ health communication awareness and professional abilities, to achieve the goal of cultivating outstanding medical talents.

Methods

Participants

The participants were undergraduate and postgraduate (both Master of Medicine and Doctor of Medicine) medical students from Shanghai Jiao Tong University School of Medicine, Fudan University School of Medicine in eastern China, and Kunming Medical University or other medical colleges in western China. All participants have given informed consent to participate in this study. The questionnaires were collected online from August 2022 to September 2022. A total of 317 individuals completed the online questionnaire, of which 314 questionnaires were considered valid after excluding 3 questionnaires completed by non-medical students.

Questionnaire Design

The questionnaire was designed in this study ([Supplementary Material 1](#)) and administered via the internet platform “WenJuanXin”. During the questionnaire design stage, we conducted a literature review and interviewed several undergraduate students to refine the survey selections. After drafting the questionnaire, we invited two experts to review and provide feedback on its content. The link of this questionnaire (<https://www.wjx.cn/vm/OAIGvSf.aspx#>) or QR code was distributed to official medical school student groups to ensure all participants were medical students. At the beginning of the questionnaire, we secured participants’ informed consent and pledged strict confidentiality of their information. All responses will be used exclusively for research data analysis. To prevent confusion among participants, we clarified in the questionnaire introduction that “participating in health communication activities” refers to medical students disseminating medical knowledge to the public rather than receiving science education from others.

The questionnaire was divided into four parts:

- A. Basic information of the respondents: grade (first year to PhD student), major, school and institution or affiliation; these baseline data can help us analyze differences among various groups.

- B. Students' attention to health communication: assessing awareness of necessity (unnecessary to very necessary), attention frequency (daily to yearly), attention platforms preferences. We listed the most popular new media platforms such as Short video platforms and WeChat public account in China alongside traditional print media magazines and newspapers for participants to select; while also including an open-ended question for additional answers. These questions aim to understand students' awareness and behavioral patterns. Their perception of necessity reflects students' value judgment toward science communication, while their frequency of engagement and platform preferences help reveal their information-seeking habits—thus aiding in designing more effective science communication channels.
- C. Students' participation experiences in health communication: including having participated or not, publishing platforms and forms, original intentions of participation or barriers for failure to participate, activities harvest and so on. The purpose of this section is to examine the correlation between behavioral intention (motivation to participate) and actual behavior (participation experiences) while analyzing participants' perceived benefits to distill success factors, thereby informing the development of incentive strategies.
- D. Capacity building willingness investigation: Students' willingness and desired support to improve their health communication ability skills, including school support, teacher guidance and so on. Based on the COM-B (Capability-Opportunity-Motivation-Behavior) model,¹² these questions evaluate the driving forces behind students' competency development and external demands, providing direct data support for universities to formulate health communication education policies while guiding students to proactively plan their personal competency development pathways.

For questions without a single correct answer, we utilized multiple-choice formats. To capture responses not covered by the listed options, we included an open-ended "Other" field for participants to fill in options not listed. All such responses were also incorporated into the results analysis. After the questionnaire collection was completed, the raw data was automatically exported from the "WenJuanXing" platform in Excel format (Microsoft Office 2019), reviewed by two researchers, and then imported into IBM SPSS Statistics 25.0 for statistical analysis.

Statistical Analysis

The obtained data were analysed using IBM SPSS Statistics 25.0 software. Qualitative data (such as student demographics, participation motivations) were expressed as the number of people, and Chi-square Test and Fisher-Freeman-Halton Exact Test were used for comparison qualitative data between groups. A level of two-sided *P*-value less than 0.05 was considered as a statistically significant difference.¹³

Results

Baseline Characteristics

A total of 317 questionnaires were collected. After excluding 3 invalid questionnaires filled out by non-medical students, 314 valid questionnaires were obtained. Including 210 undergraduates (66.88%) and 104 postgraduates (33.12%). Among the valid questionnaires, 154 students (49.04%) were from Shanghai Jiao Tong University School of Medicine, 60 students (19.11%) were from Fudan University School of Medicine, 44 students (14.01%) were from Kunming Medical University, and 56 students (17.83%) were from other medical schools in Kunming.

Students' Attention to Health Communication

In this study, 66.88% of medical students perceived participation in health communication as very necessary (Figure 1A) and 76.12% paid attention to health knowledge content more than once a month (Figure 1B). These findings indicate that respondents not only recognize the importance of health communication, but also proactively seek out relevant information. Furthermore, there were no significant differences in awareness or necessity of participating in health communication between undergraduates and postgraduates, or medical students from different schools ($P > 0.05$). This suggests a general acknowledgment of the value of health communication across different educational stages and institutional affiliations.

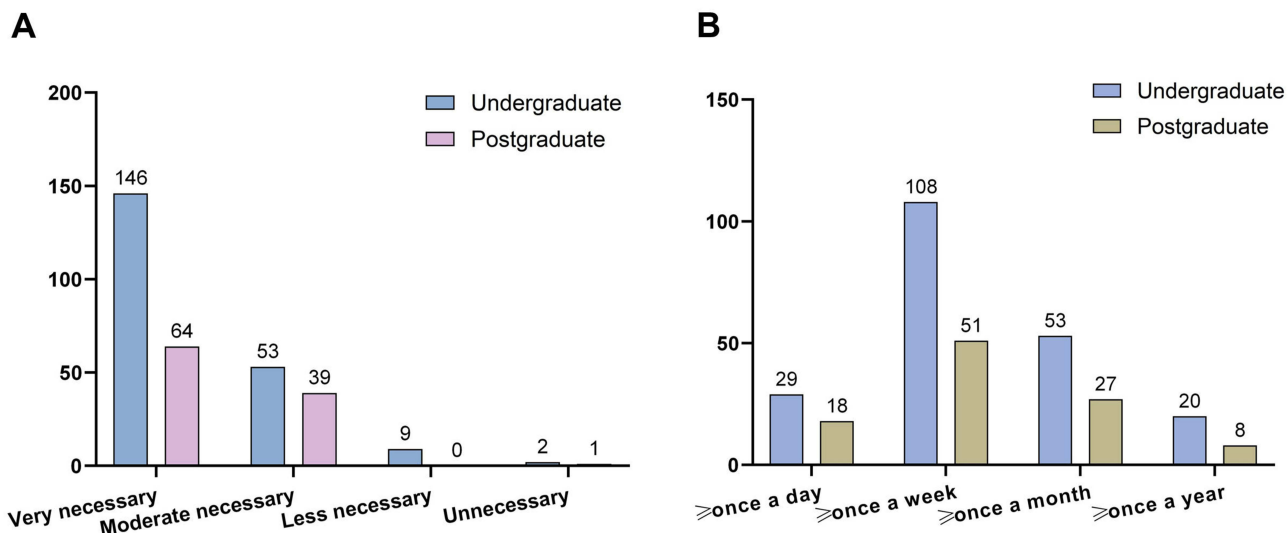


Figure 1 Medical students' attention to health communication activities. **(A)** Medical students' evaluation on the necessity of participation in health communication. **(B)** The frequency of medical students' engagement with health communication.

Regarding the platforms for obtaining health communication, a predominant number of medical students access medical knowledge through WeChat public accounts (33.42%), which is consistent with the findings of Jian Shen.¹⁴ Followed by Bilibili.com (23.18%) and Weibo (17.16%) (Figure 2A). Moreover, there was a statistically significant difference between undergraduates and postgraduates in their preferences for Bilibili.com and short video platforms like

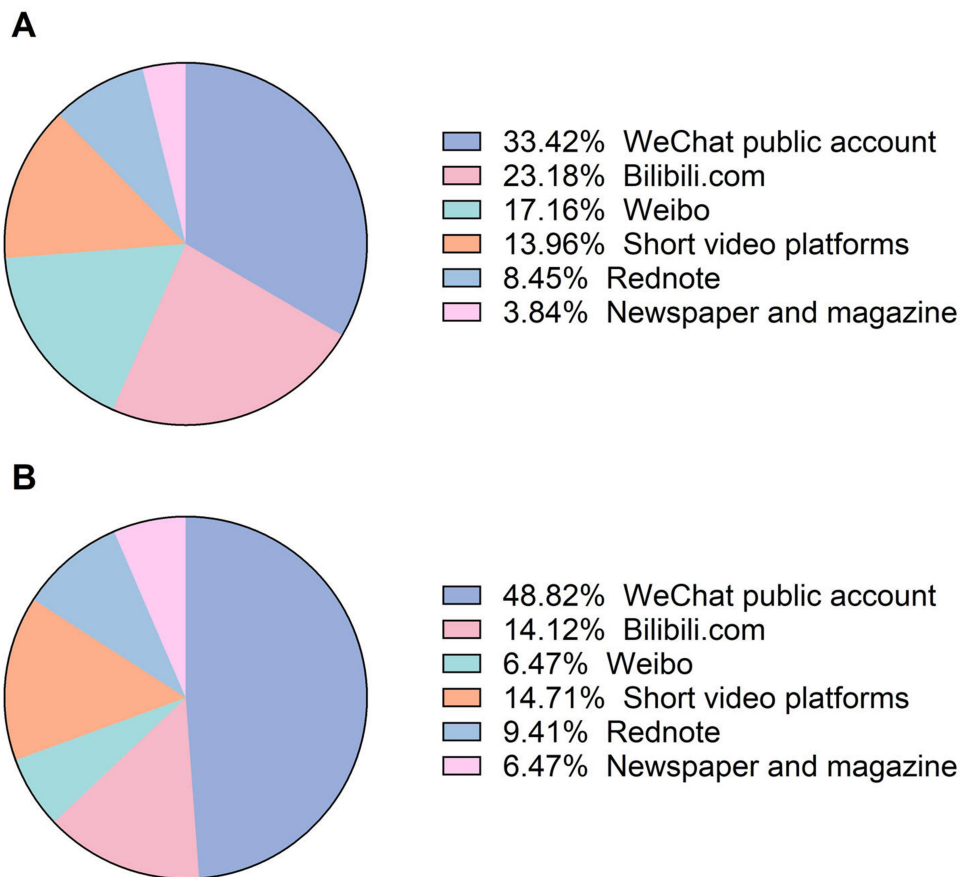


Figure 2 Obtaining and publishing platforms of health communication for medical students in this study. **(A)** Health communication obtaining platforms for medical students. **(B)** Health communication publishing platforms for medical students.

TikTok and Kuaishou. Compared to postgraduates, undergraduates exhibited a higher engagement with Bilibili.com ($\chi^2 = 7.4$, $P = 0.025$) and short video platforms like TikTok and Kuaishou ($\chi^2 = 9.0$, $P = 0.011$).

Participation in Health Communication Among Medical Students

Among the respondents, 105 (33.44%) medical students had participated or were involved in health communication, while 209 (66.56%) medical students had never engaged in such activities. The participation rates among undergraduates and postgraduates, as well as different medical schools' students, showed no significant differences. Among those who have participated in health communication, 71.43% of medical students were engaged in creating 1 to 2 health communication works. Similarly, no significant differences were observed in the number of health communication works among undergraduates and postgraduates, as well as among medical students from different schools.

Among the 105 respondents who have participated in health communication, 62.68% indicated that their primary motivation was the high demand for health communication among the public. Additionally, 60.00% of students participated in health communication mainly for the extracurricular activity credits and producing works. On the contrary, postgraduates were more aware of the public's urgent need for health communication ($\chi^2 = 4.021$, $P = 0.045$), while undergraduates tended to participate in health communication for extracurricular activities, work output ($\chi^2 = 6.684$, $P = 0.010$), and meeting outstanding teachers and classmates ($\chi^2 = 5.895$, $P = 0.015$) (Table 1).

Among the 209 medical students who have never participated in health communication, the top three influencing factors included inadequate medical professional knowledge or limited clinical experience (61.24%), heavy academic workload resulting in time constraints (47.37%), and lack of opportunities or platforms (41.15%). Notably, undergraduates identified incomplete professional knowledge and clinical experience (68.31%, $\chi^2 = 9.317$, $P = 0.002$) as significant barriers, along with a deficiency in opportunity platforms (48.59%, $\chi^2 = 10.134$, $P = 0.001$). For postgraduates, they lacked time to participate because of heavy academic workload (64.18%, $\chi^2 = 11.178$, $P = 0.001$) (Table 2).

Table 1 Medical Students' Original Intention of Participating in Health Communication (n=105)

Reasons	Undergraduate (n, %)	Postgraduate (n, %)	Total (n, %)	χ^2 Value	P value
The public has high demand for health communication	38 (55.88)	28 (75.67)	66 (62.86)	4.021	0.045
Extracurricular activity credits and works production	47 (60.29)	16 (43.24)	63 (60.00)	6.684	0.010
To meet excellent friends and teachers	27 (39.71)	13 (35.14)	40 (38.10)	0.212	0.645
To improve skills about writing, painting, video production, etc.	31 (45.58)	8 (21.62)	39 (37.14)	5.895	0.015

Table 2 Barriers for Medical Students Not Participating in Health Communication (n=209)

Reasons	Undergraduate (n, %)	Postgraduate (n, %)	Total (n, %)	χ^2 Value	P value
Medical professional knowledge and clinical experience is inadequate	97 (68.31)	31 (46.27)	128 (61.24)	9.317	0.002
Heavy study tasks and no time	56 (39.43)	43 (64.18)	99 (47.37)	11.178	0.001
Lack of opportunities or platforms	69 (48.59)	17 (25.37)	86 (41.15)	10.134	0.001
Lack of skills in writing, painting and video production	48 (33.80)	17 (25.37)	65 (31.10)	1.510	0.219
Do not understand public's demand for health communication	30 (21.13)	11 (16.42)	41 (19.63)	0.640	0.424
Have no interested in health communication activities	13 (9.15)	9 (13.43)	22 (10.53)	0.885	0.347
Schools do not pay much attention to health communication	15 (10.56)	1 (1.49)	16 (7.66)	5.298	0.021

Major Publish Platforms of Medical Students' Health Communication Works

The major platform for disseminating health communication knowledge is WeChat public accounts (48.82%) (Figure 2B), which is consistent with the platform mentioned before for medical students to access health communication knowledge. Some students also published their health communication works on short video platforms (14.71%) and Bilibili.com (9.41%) in video format.

Comparing undergraduates and postgraduates, it was found that undergraduates prefer new media platforms like Rednote, Bilibili.com more than postgraduates, and the difference was statistically significant ($P < 0.05$), suggesting that undergraduates have a wider range of platforms for disseminating their works.

Gains From Participating in Health Communication

The main benefits from participating in health communication activities include: learning relevant medical knowledge (78.10%), cultivating teamwork skills (73.33%), acquiring basic theoretical knowledge about health communication (61.90%), improving writing, painting, and video production skills (59.05%), construction and operation of health communication platforms or self-media (55.24%). Additionally, a majority of students (79.05%) said that participating in health communication activities can help them enhance their communication skills with patients. In addition, a considerable portion of respondents indicated that they would engage in more health communication activities in their spare time (57.14%) and pursue related work in the future (47.62%). Regardless of prior experience, over 80% of respondents expressed willingness to participate in these activities in the future. The results demonstrate that participating in health communication activities positively impacts medical students' competency development and career orientation, with a majority showing strong willingness to engage in health communication training.

Discussion

Advantages of Health Communication Participation

In our study, the results indicated that participating in health communication plays a crucial role in enhancing abilities of medical students and can even impact their future careers. 79.05% of respondents agreed that involvement in health communication would improve doctor-patient communication skills, and 57.14% intended to dedicate more spare time to popularize science in their future careers. On the one hand, carrying out health communication activities can not only help medical students clarify misconceptions, but also deepen their own understanding, consolidation, and memory of relevant knowledge, thus enhancing their learning motivation. On the other hand, the establishment of effective physician-patient relationships requires science communication skills, while the cultivation of medical practitioners' compassion needs to be integrated throughout the entire educational process,¹⁵ participating in health communication aids in improving doctor-patient communication skills, enhancing medical humanities literacy, and ultimately boosting practical abilities. Amelie Daoust-Boisvert et al analysed the characteristics and self-reported motivations of students who participated in online science communication courses at Laval University from 2009 to 2018 to present that students enrolled in health communication are in career-orientated motivation pattern, they view health communication skills as an asset for a career in communication, science, and health.¹⁶ In the long run, participating in health communication enables medical students to perceive their future work from a new perspective, foster comprehension of medical humanities, reinforce intrinsic motivation in medicine, strengthen professional identity and realize social value.

How to Improve Medical Students' Health Communication Ability

In order to promote health communication in medical students, collaboration among medical students, teachers, medical schools, and social media is required.¹⁷ Therefore, we put forward effective suggestions from different aspects:

Medical Students

Medical students, burdened with heavy coursework and limited knowledge reserves, have insufficient health communication skills.¹⁸ To improve medical students' participation in health communication, we need to focus on cultivating medical students' basic literacy and integrating professionalism with interest. Enhancing the basic science literacy of medical students includes strengthening their own awareness and foundational skills. Medical students should recognize

their significant responsibilities and social roles, and undergraduate students can also begin their training in science communication.¹⁹ Medical students can elevate their basic literacy by participating in health communication talks, skills training lectures, health forums and so on. Besides, staying abreast of cutting-edge and trending health issues in daily life, learning from excellent health communication works, and communication skills of professional science communicators is also essential.

Moreover, engaging in health communication demands medical students to possess certain foundational and subject-specific knowledge. To address the issue of insufficient knowledge reserves among undergraduate students, preliminary research can be carried out to understand the public's specific needs, which allows students for targeted knowledge expansion. It is worth mentioning that one challenge in science communication is how to make the target audience access, generate interests, and truly comprehend the content. Therefore, medical students can start from the side by educating their families and friends about medical knowledge and promoting healthy lifestyle concepts.

Teachers

As medical students, especially undergraduates, often lack comprehensive medical knowledge, which may lead to inaccuracies in health communication. To address this, health communication projects should be equipped with faculty supervision. Physicians and teachers, with their understanding of patients' misconceptions and medical concerns, can guide students in choosing appropriate topics and leverage their professional status to attract a wider audience. Faculty can also integrate health communication with research and education work. In terms of advice on teaching methods, some research indicated that Small Private Online Course (SPOC) blended teaching was judged as more suitable for health communication education because of characteristics including a variety of delivery formats, high efficiency of dissemination, and high precision of the course content.^{20–22} Furthermore, under the leadership of scientific and technological associations, health communication can be combined with academic communication and scientific awards. The scientific and educational teams should strengthen the organizational management from the establishment of health communication projects, provide advice and suggestions in the development of a comprehensive evaluation system, and guide students in aspects such as applications, activity planning, funding implementation, thus advancing health science communication to a higher level.

Medical Schools

The level of attention medical schools pay to the implementation of health communication projects significantly influences students' participation. Our results showed that 60.00% of medical students are drawn to health communication for the opportunities to expand their extracurricular activities credits and produce works, suggesting that schools can integrate health communication participation as part of an array of electives related to students' academic program, credits and scholarships.²³ The reason why 41.15% of medical students failed to participate is the lack of opportunities and platforms, indicating that schools can set up specialized clubs and organizations to facilitate health communication projects, offering platforms and opportunity support, and organize events of a certain scale periodically to strengthen event publicity and attract more students.

Consequently, universities should strengthen the sense of mission and set science communication as regular work. These are some suggestions. Firstly, incorporate health communication courses into the curricula teaching plans, carry out comprehensive training program and emphasize the knowledge of health communication in regular courses.²⁴ Schools also can offer training lectures for students to choose, covering but not limited to theoretical knowledge of health communication, practical skills training on writing, painting or video production, appreciation of excellent works, interdisciplinary courses and so on. Secondly, setting up dedicated departments for science communication. Science communication offices may adopt university-based or society-based models, requiring universities and research institutes to integrate resources and seek innovation in the training of professional talents, the construction of work system and incentive mechanism.²⁵ Thirdly, the creation of high-quality original works demands substantial time, effort, and financial resources, adequate funding support for health communication projects is also essential. However, it is important to note that some students prefer not to have their participation in health communication directly linked to their grades or credits, as shown by our questionnaire results. Initiatives should be interest-driven rather than mandatory.

Social Media

With the development of the Internet and technology, the expression content of health communication is no longer limited to text, and the dissemination mode is no longer limited to traditional paper books and TV broadcasts.²⁶ WeChat, as the most popular social networking tool,²⁷ enables individuals or professors communicate and interact with specific groups of texts, pictures and voices in an all-round way on the WeChat platform.²⁸ Official WeChat public account has emerged as the predominant medium for both undergraduate and postgraduates due to its characteristics of convenience, effectiveness and sustainability. Other platforms are less utilized for promotion. Due to the COVID-19 epidemic, online live broadcasts have gradually emerged.²⁹ Live broadcast platforms are characterized by low threshold and convenient interaction, representing a novel social medium for knowledge interaction. However, only a minor fraction of medical students (17.14%) used this method to popularize science, indicating a potential area for further exploration by students based on sufficient preliminary research. It is necessary to explore a health communication service model oriented to medical students' needs and centered on a new media matrix.³⁰

In addition, the limited reach of student-published scientific content, typically distributed through personal social media and platforms, undermines its impact and promotional effectiveness. Therefore, broad social media and online platforms could collaborate with universities and student organizations to establish authoritative accounts or websites to receive, select, and publish scientific submissions periodically from medical students, thereby creating a health science brand that bridges the gap between medical students and the general public.³¹ Sharing relevant content during medical-related holidays or anniversaries, like World Sleep Day or National Patriotic Health Month, could expand visibility and audience reach. These initiatives would foster a social atmosphere that respects and venerates scientific dissemination, offering broader possibilities for health science communication.

It is worth noting that disparities in the accessibility and utilization of medical information between different social and economic groups are growing wider and issues of asymmetry in medical knowledge and health inequality are becoming worse. For example, the elderly and children are easily ignored in health communication due to limited economic conditions and resource in the context of new media.³ Against this backdrop, more offline health communication measures should be taken, such as holding elderly health knowledge lectures, posting popular science works on bulletin boards in communities or primary schools, and utilizing radio broadcasts. Effective health communication should center around the audience with a service-oriented mindset, ensuring that the information is accessible and understandable to the general populace and patients, avoiding being a formality or blindly just following the trend. At the same time, evaluating the effectiveness of communication through the audience's knowledge acquisition and satisfaction level is essential.³²

Strengths and Limitations

This study conducts a cross-sectional survey on medical students' participation in health communication, analyzes the influencing factors and existing problems, and proposes well-considered recommendations from the four aspects: students themselves, platform guidance, school support, and faculty involvement to boost medical students' enthusiasm and initiative in participating in health communication.

However, the study has several limitations: Firstly, the number of participants and the schools involved in the questionnaire survey are limited, mainly focusing on higher education institutions, which might introduce a selection bias. Secondly, we did not conduct relevant factor analysis or linear regression analysis on the influencing factors of participation in health communication activities to ascertain the specific impact relationships of various factors on participation levels. Thirdly, the current study did not investigate the attitudes of medical and non-medical students towards health communication platforms since the research subjects were primarily drawn from medical schools in China. Future research could expand the sample scope to multiple countries to enhance the generalizability of the findings. Additionally, interdisciplinary comparative research is needed to explore the differences in knowledge acquisition patterns and communication strategies among students from different disciplines in the field of health communication.

Conclusions

This article highlights the importance of medical students' participation in health communication, with a significant proportion of students recognizing its value. However, the heavy academic workload, insufficient professional knowledge, and limited

clinical experience, result in a low level of participation in health communication. In addition, the limited credibility and weak dissemination abilities, along with a narrow scope of health communication dissemination, it is challenging for medical students to achieve ideal health communication practices without school's support and teacher's guidance. Therefore, it is recommended that medical students, teachers, schools, and social media join forces. Improvements should be made across multiple dimensions to fully mobilize the enthusiasm of medical students to participate in health communication.

Abbreviations

COVID-19, Coronavirus Disease 2019.

Data Sharing Statement

The data relevant to this study are available from the corresponding author upon reasonable request.

Ethics Approval and Consent to Participate

The study protocol complies with the Declaration of Helsinki and has been thoroughly reviewed and approved by the Ethics Committee of Shanghai Ninth Hospital, School of Medicine, Shanghai Jiao Tong University (SH9H-2022-T203-1). All participants in the study are legally adults (aged 18 and above) and provide their own informed consent.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no competing interests in this work.

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