

New Media Short-Video Teaching in Dermatology Education in Primary Hospitals: An Applied Research

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Abstract: *Objective:* To analyze the application effect of short-video teaching in standardized training of dermatology residents in view of the shortage of teachers, fragmented teaching, and insufficient public knowledge of skin protection in primary dermatology departments. *Methods:* A total of 60 standardized training and grassroots rotating physicians were enrolled and equally divided into two groups. The control group received traditional teaching, while the observation group adopted short-video blended teaching. Theoretical and practical scores, skin lesion identification ability, and teaching satisfaction were compared between groups, and the effect of popular science education was evaluated. *Results:* The observation group achieved significantly higher theoretical scores, practical scores, skin lesion identification accuracy, and teaching satisfaction than the control group ($P < 0.05$). The awareness rate of skin disease prevention and control among grassroots residents increased from 41.7% to 87.2%. *Conclusion:* Short-video teaching makes up for the lack of teaching resources at grassroots institutions, improves the quality of standardized training, balances clinical teaching and public disease prevention education, and is worthy of promotion in primary dermatology departments.

Keywords: Primary hospital; Dermatology department; Short video; New media; Dermatology education

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1. Introduction

In primary healthcare, skin diseases are common and frequently encountered clinical conditions. The incidence of various types, such as dermatitis, fungal infections, allergy, and so on, remains high ^[1,2], which are the primary diseases treated at primary hospitals and significantly impact the quality of life for local

residents. As an indispensable clinical department in primary hospitals, dermatology fulfills three key functions: diagnosing and treating skin diseases among the local population, providing specialized training for physicians from small town hospitals, and educating the public about skin health. It is an important part of the primary healthcare system. However, there are three prominent shortcomings in the training of dermatology residents at primary hospitals at present. Firstly, the faculty in this specialty is under-resourced, with a low proportion of senior physicians; due to heavy clinical workload, training time is fragmented, making it difficult to conduct systematic and standardized teaching. Secondly, there is a lack of alignment between the curriculum and the primary clinical needs. Traditional teaching focuses on the theory of diagnosing and treating rare and complex diseases, while the coverage of common skin diseases encountered in primary hospitals is neither systematic nor sufficiently tailored to those needs. Thirdly, teaching methods are monotonous and rigid, relying primarily on oral lectures and textbook-based theory, which fails to align with dermatology's core characteristic as a "morphology-focused" discipline. As a result, residents and junior physicians have weak diagnostic skills, master clinical procedures only with difficulty, and face limitations in improving their clinical abilities. Meanwhile, community people have limited access to gaining knowledge on skin health protection and lack awareness of disease prevention, which leads to high rates of both incidence and recurrence of skin diseases. Therefore, skin health education at the grassroots level urgently needs to be improved.

Short videos on new media platforms have significant advantages, including visual appeal, standardization, replayability, and quick sharing ^[3], which not only meet the needs of residency-trained physicians in primary hospitals for fragmented learning and consolidation, but can also be directly applied to public health education on skin health for community people ^[4,5]. Taking dermatology residency training in primary hospitals as its starting point, this study establishes a short-video teaching system that integrates "residency training and health education" in a two-way approach. It systematically evaluates the effectiveness of this system in clinical teaching, providing a reference for improving the standardized training model for dermatology professionals and enhancing the quality of dermatological care in primary hospitals.

2. Study subjects and methods

2.1. Study subjects

A total of 60 participants—including residents undergoing standardized training and physicians from primary hospitals who rotated in Shanghai Changzheng Hospital's Department of Dermatology from January 2022 to December 2025—were selected as the study subjects.

Inclusion criteria: (1) Rotation duration in the department ≥ 4 weeks; (2) Full participation in all instructional courses and assessment processes; (3) who voluntarily participated in this study and signed the informed consent form.

Exclusion criteria: (1) who withdrew from the rotation program before completion or failed to fulfill their teaching responsibilities; (2) who had specialized training and work experience in dermatology.

The study subjects were randomly divided into a control group and an observation group based on the order of entry to the department, with 30 participants in each group. The control group consisted of 22 men and 8 women, aged 24–31 years, with a mean age of 26.8 ± 1.9 years; the observation group consisted of 24 men and 6 women, aged 23–32 years, with a mean age of 27.1 ± 2.1 years.

A comparison of general characteristics—including gender, age, pre-department theoretical foundation scores, and clinical rotation experience—between the two groups revealed no statistically significant differences ($P > 0.05$).

2.2. Teaching content and video production

Based on the daily clinical practice in dermatology departments at primary hospitals, the characteristics of common diseases, and the needs of primary medical services, 12 core teaching contents were selected and organized into three major categories. Standardized instructional videos were produced for each.

- (1) Basic operations (4 items): aseptic dressing change for skin wounds; standard procedures for cold compresses/wet compresses for acute dermatitis; proper application of topical medications; procedure for collecting skin lesion samples and submitting specimens for testing.
- (2) Disease diagnosis and treatment (6 items): recognition and management of immersion dermatitis, tiered diagnosis and treatment of sunburn and its prevention; standard treatment for insect-bite dermatitis; standardized diagnosis and treatment of superficial fungal infections; comprehensive management of acne vulgaris; standard management of contact dermatitis.
- (3) Health education (2 items): key points of preventing common skin diseases in summer; guidelines for daily skin care.

All videos are filmed and produced under the direction of senior dermatology attending physicians, with the duration of each video strictly limited to 3 minutes or less. The videos focus on typical skin lesion patterns and key clinical procedures, accompanied by standard subtitles and professional narration. The content strictly adheres to *Clinical Dermatology* and the *Guidelines for the Prevention and Treatment of Common Skin Diseases in Primary Care*. After being reviewed and proofread by the department's director of instruction, the videos are added to the repository, forming a standardized teaching resource repository.

2.3. Teaching methods

- (1) The control group used the traditional mentoring model. Upon joining the department, objects receive an overview of the department and an explanation of the teaching schedule. They follow the senior physicians to conduct daily outpatient service, ward rounds, and case discussions. A short theoretical lecture will be held once a week, and all objects will take the final exam at the end of the rotation period.
- (2) The observation group adopted a blended learning model centered on short videos. The program integrates the four core phases—"Before Class, During Class, After Class, and Science Education Extension"—to build a systematic, closed-loop teaching system.

Before Class: Targeted short videos related to the one-week teaching topic will be delivered on Monday. The objectives are to watch the videos in advance, be familiar with the characteristics of typical skin lesions, clinical diagnostic and treatment approaches, and basic procedural steps. They will complete the pre-class review quiz, which consists of 5 multiple-choice questions, to ensure they have effectively prepared for the lesson.

During Class: During outpatient consultations and bedside rounds, attending physicians review and explain teaching content with the delivered short videos in conjunction with real clinical cases, focusing on correcting objects' misjudgments of skin lesions, misconceptions in diagnostic and treatment approaches, and non-standardized procedures.

After Class: We send out one short video on a key concept every day for objects to watch and review, and we provide Q&A through the department's teaching WeChat group. We also organize a weekly short quiz on dermatological image recognition and case analysis to continuously consolidate learning outcomes and strengthen clinical reasoning.

Science Education Extension: Short videos on health education will be simultaneously shared with community health service groups and primary outpatient service education groups, to provide local residents with information on daily skin health and guidance on the prevention of seasonal skin diseases. This not only broadens the scope of educational applications but also helps to support grassroots public health services.

2.4. Evaluation indicators

- (1) Theoretical and practical assessments: Once the rotation is complete, a standardized closed-book test will be organized. The theory paper is marked out of 100 and focuses on the diagnosis and treatment of common skin diseases at the grassroots level, as well as fundamental theory and public health knowledge regarding the prevention and control of skin diseases. The clinical skills assessment is marked out of 100. The assessment covers tasks such as removing sutures and changing dressings, incision and drainage of abscesses, and case analysis. It is scored independently by two senior physicians, and the average of their scores is taken as the final score.
- (2) Case identification accuracy rate: Select 20 images of typical skin lesions of common dermatological diseases encountered in primary hospitals. Then, the objects carry out diagnosis, differential diagnosis, and initial treatment independently, and the accuracy rate is to be recorded.
- (3) Teaching satisfaction: The research will be conducted using an anonymous questionnaire survey, which covers four core dimensions including the appeal of teaching, the effectiveness of knowledge acquisition, the practicality of clinical skills operation, and suitability for primary care settings. Satisfaction ratings are classified as very satisfied, satisfied, neutral, and dissatisfied. Overall satisfaction = (Very satisfied + Satisfied) / Total number of objects $\times$ 100%.
- (4) Community awareness of prevention and control measures: A random sample of 120 members of the local community will be selected to compare changes in their awareness of key points regarding the prevention and care of common skin diseases before and after the dissemination of science popularization by short videos, which is used to assess the practical value of such videos.

2.5. Statistical approach

Data analysis is performed using SPSS 26.0 statistical software. Measurement data are expressed as the mean $\pm$ standard deviation (SD), and a *t*-test is used for comparison between two groups. Categorical data are expressed as percentages (%), and comparisons between two groups are performed by χ^2 test. $P < 0.05$ indicates a statistically significant difference.

3. Results

3.1. Comparison of the examination results between two groups

The observation group's scores in both the theoretical and practical examinations were significantly higher than those of the control group, and the differences were statistically significant ($P < 0.05$) (**Table 1**).

Table 1. Comparison of the examination results between two groups

	Control group	Observation group	<i>t</i> value
	<i>n</i> = 30	<i>n</i> = 30	(χ^2 value)
Theoretical score	78.5 ± 5.1	89.2 ± 4.3	8.792 (<0.001)
Operational score	27 (90.0%)	28 (90.3%)	10.241 (<0.001)

* $P < 0.05$ means statistically significant.

3.2. Comparison of accuracy rates in case analysis between two groups

The case analysis accuracy rate for objects in the observation group was 90.0% (18/20), whilst that for the control group was 73.3% (14.7/20); the observation group's rate was significantly higher than that of the control group, and the difference was statistically significant ($\chi^2 = 6.342$, $P = 0.012$).

3.3. Comparison of teaching satisfaction between two groups

Overall teaching satisfaction in the observation group was 93.3%, which was significantly higher than the 70.0% recorded in the control group. The difference was statistically significant ($P < 0.05$) (Table 2).

Table 2. Comparison of teaching satisfaction between two groups

	Control group	Observation group	<i>t</i> value
	<i>n</i> = 30	<i>n</i> = 30	(χ^2 value)
Very satisfied	8 (26.7%)	16 (53.3%)	-
Satisfied	13 (43.3%)	12 (40.0%)	-
Neutral	7 (23.3%)	2 (6.7%)	-
Dissatisfied	2 (6.7%)	0 (0.0%)	-
Overall satisfaction	21 (70.0%)	28 (93.3%)	5.455 (0.020)

* $P < 0.05$ means statistically significant.

3.4. Changes in awareness of prevention and care of common skin diseases among the local community

Before the dissemination of science popularization by short videos, the average awareness rate of prevention and care knowledge of common skin diseases among 120 members of the local community stood at 41.7%. One month after the dissemination, a follow-up assessment showed that the average awareness rate had risen to 87.2%, and the difference was statistically significant ($P < 0.001$).

4. Discussion

4.1. Short video tutorials precisely address the key challenges faced by dermatology in primary hospitals

Skin diseases are one of the most common health conditions in daily life. The Global Burden of Disease Study 2021 ranked skin diseases among the top ten causes of non-fatal disease burden worldwide [6]. Dermatology departments in primary hospitals generally face real challenges of high outpatient caseloads, a wide variety of diseases, a shortage of teaching staff, and limited rotation periods for residents. Traditional

training models rely chiefly on oral explanations based on the personal experience of the senior physicians and lack a unified, standardized teaching system. As a result, there are differences in diagnostic and treatment approaches, differential diagnosis, and operational protocols among different senior physicians, which can easily lead to residents acquiring fragmented knowledge. What's more, traditional teaching methods typically consist of one-off lectures and live demonstrations, which cannot be reviewed or replayed; as a result, residents have a low retention rate for abstract skin lesions and intricate procedural details, making it difficult for them to quickly develop a standardized approach to clinical diagnosis and treatment. In recent years, social media has become an increasingly powerful tool for doctors to share their professional knowledge with one another, with students, with patients, and with the general public ^[7-9]. Social media platforms, such as Weibo, YouTube, TikTok, and so on, have revealed many potential uses, with an increasing number of journals, scientists, and researchers utilizing them to reach end users and engage in education and the dissemination of knowledge ^[9,10]. Through standardized filming practices and rigorous content review, short-video-based teaching has established a standardized dermatology teaching system at the grassroots level. This has effectively addressed the teaching inconsistencies caused by varying levels of expertise among grassroots teaching staff, thereby ensuring a consistent standard of teaching quality. At the same time, with their short, concise, and fast nature, short videos are highly suited to the reality of resident doctors' busy clinical schedules and fragmented study time. They can use the spare time to rewatch and review the content to overcome learning difficulties. This solves the shortcomings of traditional teaching, which often lacks opportunities for repeated learning and results in poor consolidation of knowledge, significantly enhancing learning efficiency.

The clinical manifestations of many skin diseases are heterogeneous ^[11-16]. Accurate identification of skin lesions and standardized management procedures are critical clinical skills that resident doctors must master. Compared with traditional text-based teaching materials and static images of clinical cases, short videos can present the morphological characteristics of skin lesions at different periods from multiple angles. Besides, short videos can also entirely replicate the full process of standardized clinical operations. They are better suited to the way the human eye learns and can help resident doctors quickly establish the correlation between skin lesions and disease diagnosis and treatment. Our study shows that residents in the observation group achieved significantly higher accuracy in case analysis and better results in both theoretical and practical examinations than those in the control group. This fully confirmed that short-video-based teaching can effectively enhance the clinical skills of resident doctors in primary hospitals and help junior physicians develop rapidly.

4.2. Two-way empowerment: Combining teaching quality with public skin health services at the primary care level

Dermatology teaching in primary hospitals differs from that in tertiary hospitals, as they bear public health responsibilities for the prevention and control of skin health issues among local communities, as well as for raising awareness of the diagnosis and treatment of skin diseases at the primary care level. The short-video-based teaching system established in this study breaks away from the traditional, single-purpose model of teaching aimed solely at resident doctors, realizing the practical value of “a single resource pool, two-way empowerment and universal access to medical education.”

At the educational level, standardized and systematic short-video teaching resources have effectively addressed the shortage of dermatology teaching resources at the grassroots level, standardized the training

process for specialist trainees, and comprehensively enhanced their specialist theoretical knowledge, clinical practical skills, and ability to recognize diseases. This has provided grassroots healthcare institutions with a greater number of specialized and properly trained future dermatology professionals, thereby strengthening the foundation of dermatological healthcare services at the grassroots level. In the context of public health services, specially produced short videos of health education can be directly deployed for community outreach, outpatient education, and daily health guidance^[3,7,10]. All these initiatives have filled the gap caused by a lack of public health education resources on skin health at the grassroots level and the limited variety of educational formats. The significant increase in awareness of skin disease prevention among the community population observed in this study confirms that this educational model can effectively raise awareness of skin health protection among the community population, reduce the incidence and recurrence of skin diseases, alleviate the burden of skin disease consultations at the grassroots level, and truly achieve the primary healthcare objective of “promoting medical care through education, promoting prevention through medical care, and integrating prevention and treatment.”

4.3. The advantages of promoting short-video-based teaching models in primary hospitals and areas for optimization

The promotion of new media short-video-based teaching models in dermatology departments at primary hospitals exhibits significant advantages. First, the production process has a low entry threshold and manageable costs. It requires no specialist equipment or complex technology, and departments can carry out content production, review, and updates with their existing teaching staff. Second, dissemination is convenient and efficient. Contents can be shared via WeChat or short-video platforms, without being constrained by time, location, or personnel, making it well-suited to the fragmented working environments of primary healthcare settings. Third, the content is flexible and can be updated iteratively. Teaching and public education materials can be dynamically updated in line with seasonal epidemiological trends, changes in the prevalence of common diseases in primary hospitals, and the latest clinical guidelines. Thereby, it can precisely meet the phased diagnostic and treatment and health education needs of primary care settings, and make the teaching more practical and targeted.

4.4. Shortcomings and prospects

As this is a single-center study with a limited sample size, there are certain limitations to the research. In the future, the sample size could be expanded, and a multi-center controlled study could be conducted in collaboration with several primary hospitals to further validate the universality and effectiveness of the short-video teaching model. Moreover, at this stage, short videos’ content mainly focuses on independent basic diagnosis and treatment, as well as routine operations. A systematic resource framework has not been established. It will therefore be necessary to establish a regularized mechanism for content updates, review, and iteration to ensure that the content remains aligned with the latest diagnostic and treatment guidelines and the clinical needs of primary care settings. In the future, our research findings could be used to establish a standardized repository of micro-lecture resources for dermatology departments in primary hospitals, complemented by features such as online exercises, case study submissions and online Q&A sessions. This would help to establish a systematic, intelligent and sustainable platform for dermatology education and health awareness at the grassroots level, which will further improve the quality of dermatology professionals at the grassroots level and enhance the standards of dermatological health prevention and control at the

grassroots level.

5. Conclusion

The new media short-video teaching model is closely aligned with the current state of clinical diagnosis and treatment in dermatology departments at grassroots hospitals, their teaching needs, and grassroots public health services. It effectively enhances the theoretical knowledge, clinical skills, and accuracy of skin lesion differentiation among dermatology residents, whilst significantly improving satisfaction with the teaching programs. What's more, it also supports skin health education at the grassroots level, raising public awareness of the prevention and care of skin diseases. Hence, it combines high educational value with public health value, making it a new and highly effective teaching model suited to dermatology departments in primary hospitals. In summary, this model delivers significant teaching outcomes, is cost-effective to implement and highly practical, and holds great promise for clinical application and widespread adoption.

Disclosure statement

The authors declare no conflict of interest.

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