

Application of Evernote in Improving Surgical Teamwork Quality in General Hospitals: Post-print

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Abstract

Objective To explore the application of Evernote in improving surgical cooperation quality in general hospitals, thereby enhancing surgical cooperation quality, improving professional comprehensive abilities of surgical nurses, promoting standardization and homogenization of specialized operations, and facilitating efficient and stable operation of the operating room. **Methods** Through specialized groups writing surgical cooperation notes in the Evernote APP, real-time efficient updating and sharing of surgical notes among all department personnel was achieved, constructing a professional knowledge base for the operating room covering training courses, equipment, cutting-edge information, etc., forming a platform for professional knowledge sharing in the operating room. **Satisfaction** with surgical cooperation quality and professional comprehensive abilities of surgical nurses before and after using the Evernote APP were evaluated. **Results** Compared with before using the Evernote APP, after using the Evernote APP, satisfaction with surgical cooperation quality improved ($P < 0.01$), and professional comprehensive abilities of surgical nurses were enhanced ($P < 0.01$). **Conclusion** Application of the Evernote APP in operating room management can effectively improve surgical cooperation quality and professional comprehensive abilities of surgical nurses.

Full Text

The Application of Evernote in Improving Surgical Cooperation Quality in General Hospitals

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Abstract

Objective To explore the application of Evernote in improving surgical cooperation quality in general hospitals, enhance the professional comprehensive ability of surgical nurses, promote the standardization and homogenization of specialized operations, and facilitate efficient and stable operating room management. **Methods** Specialized teams used the Evernote app to write surgical cooperation notes, enabling real-time and efficient updating and sharing of surgical notes across all staff, and building a professional knowledge base for the operating room covering training courses, instruments and equipment, and cutting-edge information, thereby forming a platform for professional knowledge sharing. Satisfaction with surgical cooperation quality and the professional comprehensive ability of surgical nurses were evaluated before and after Evernote implementation. **Results** Compared with pre-implementation, surgical cooperation quality satisfaction improved ($P < 0.05$) and surgical nurses' professional comprehensive ability enhanced ($P < 0.05$) after using the Evernote app. **Conclusion** Applying the Evernote app in operating room management can effectively improve surgical cooperation quality and nurses' professional comprehensive ability.

Keywords: operating room; surgical cooperation quality; surgical nurses; professional comprehensive ability; Evernote

With the rapid development of surgery, numerous sophisticated and cutting-edge devices have been introduced, and surgical categories have become increasingly complex and diverse. Maintaining safe, stable, and efficient operating room operations requires nursing staff to master multidisciplinary theoretical knowledge and technical expertise to provide safe, high-quality patient care [1]. Surgical notes represent one of the most effective ways for operating room nurses to accumulate specialized knowledge, constitute a critical component of improving specialized nursing quality, and serve as the most efficient method for junior nurses to grow professionally [2]. However, paper-based surgical notes are inconvenient to modify, struggle to keep pace with rapidly evolving surgical techniques, are time-consuming to search, offer limited expression formats, and make it difficult to visually describe anatomy and complex precision instruments. They also cannot be easily shared or collaboratively edited. Evernote is a widely used note-taking software with deep applications in education [3] but limited adoption in healthcare. Its ability to synchronize data in real-time across mobile (iOS, Android) and desktop platforms enables the creation of vivid and engaging surgical notes with efficient real-time recording and updating, supporting rich, multi-scenario applications that facilitate various teaching and training activities [4]. The convenience of knowledge storage significantly influences the efficiency and frequency of knowledge utilization [5]. Using the Evernote app for real-time updating and sharing of surgical notes to build an operating room professional knowledge base creates a department-wide shared learning platform that standardizes and homogenizes surgical cooperation and

specialized operations.

1. Materials and Methods

1.1 Study Design and Participants This study was conducted in a comprehensive tertiary teaching hospital with 25 operating rooms and approximately 20,000 annual surgical cases. Thirty operating room nurses were selected, with 3 males and 27 females, aged 28.5 ± 5.2 years, and with 8.3 ± 4.1 years of operating room experience. The group included 1 deputy chief nurse, 5 charge nurses, and 24 staff nurses. A self-controlled design was employed, with nurses before Evernote app implementation serving as the control group and the same nurses after implementation (starting January 2020) as the observation group.

1.2 Evernote Implementation in the Operating Room Beginning in January 2020, the teaching team leader managed the process with specialized team guidance, using Evernote to create electronic surgical notes and build an operating room professional knowledge base. A premium account was registered and purchased, accessible to all staff for multi-device real-time synchronization and sharing. The surgical notes followed a three-level directory structure (Department → Surgical Procedure → Surgical Notes) with tags added for convenient retrieval. Content was standardized in format and structure.

Over three months, the team collected and organized nearly 200 surgical note entries, instrument operation procedures and precautions, instructional videos of nursing techniques, case analyses, nursing rounds, and cutting-edge professional information to establish the knowledge base. Notes were drafted using a five-template framework covering anatomical structures, patient positioning, material preparation, surgical steps and cooperation, and experience sharing. A two-round expert meeting method was used to screen note items and finalize these five core sections. The department was divided into four major specialties with 16 subspecialties, including joint surgery, sports medicine, spine surgery, trauma surgery, gastroenterology, hepatobiliary surgery, colorectal surgery, thyroid and breast surgery, cardiothoracic surgery, urology, neurosurgery, obstetrics, gynecology, ENT, ophthalmology, and hand/foot surgery. Each specialized team leader was responsible for reviewing and calibrating surgical cooperation notes to ensure professionalism and rigor.

1.3 Evaluation Methods Surgical Cooperation Quality Satisfaction Survey: A satisfaction questionnaire was distributed to surgeons, evaluating five dimensions: preoperative item preparation, surgical positioning, instrument usage, cooperation rapport, and work efficiency, each scored 0-20 points for a total of 100 points. Survey inclusion criteria for surgeons: holding medical practice license, working continuously in the department for over 3 years, and directly participating in surgeries as primary or assistant surgeons. Exclusion criteria: interns, rotating residents, or physicians on extended leave.

Surgical Nurse Professional Comprehensive Ability Assessment: Competency was evaluated across four dimensions: specialized professional ability, other specialty comprehensive ability, emergency response capability, and predictive ability [6]. Each item was scored 1-5 points, with higher scores indicating greater ability (total score 100). Assessment was conducted by a 5-member evaluation panel including 2 specialty team leaders, 1 head nurse, and 2 senior nurses with over 15 years of operating room experience, who scored cases based on professional competency criteria.

1.4 Statistical Methods SPSS software was used for data analysis. Measurement data were expressed as mean \pm standard deviation ($\bar{x}\pm s$) and compared between groups using t-tests. Count data were expressed as percentages (%) and analyzed using χ^2 tests. The significance level was set at $\alpha=0.05$.

2. Results

2.1 Surgical Cooperation Quality Satisfaction Comparison A total of 45 surgeons across all levels were included. Before training, 45 satisfaction surveys were distributed; one year later, the same surgeons were surveyed again, with 43 surveys collected. The results showed that Evernote app implementation significantly improved surgical cooperation quality satisfaction scores, with statistically significant differences ($t=5.23$, $P<0.01$) .

2.2 Operating Room Nurse Professional Comprehensive Ability Comparison Evernote app implementation significantly improved operating room nurses' professional comprehensive ability, with statistically significant differences ($t=4.87$, $P<0.01$) .

3. Discussion

Real-time updated surgical notes and experience sharing promote integration of subspecialty knowledge, improve surgical cooperation quality, and enhance surgeon satisfaction. With Evernote, operating room nurses can access and record surgical notes anytime and anywhere, increasing the frequency of reading and writing notes and facilitating knowledge mastery. The app consolidates the entire department's professional knowledge, leveraging specialized team advantages and skills while merging nurses' expertise and experience through teamwork to professionalize and detail surgical cooperation. As a comprehensive tertiary hospital performing increasingly complex and difficult surgeries requiring multidisciplinary collaboration, plus emergency surgeries from various specialties, nurses need comprehensive knowledge and rapid assessment capabilities. Specialized nurses lacking general surgical knowledge inevitably have reduced control and emergency response capacity for emergencies. Mastering cooperation across all surgical types enables comprehensive, detailed, and accurate surgical support, improving item preparation rates, cooperation rapport, and

professional skills [7], thereby increasing surgeon satisfaction, accelerating surgical pace, reducing operation time, and benefiting patient outcomes.

Evernote provides professional guidance, collects specialized materials, builds an operating room knowledge base, and creates a shared learning platform that enhances nurses' professional comprehensive ability. The knowledge base offers professional guidance for new and trainee nurses, shortening training time and improving effectiveness. Junior nurses can access training materials and detailed surgical notes immediately after completing cases, rapidly building their knowledge system and promoting patient safety. Regular updates to the professional knowledge base encourage continuous learning and knowledge internalization, helping nurses master cutting-edge information and innovate in practice.

Standardized, professional, and efficient note sharing facilitates specialization and homogenization of specialized operations and surgical cooperation. Since circulating and scrub nurses have different responsibilities and knowledge gaps when cooperating on a case, standardized sharing helps achieve homogenization. Moreover, a positive note culture not only encourages continuous professional development but also enhances professional identity [8], promotes department culture, and elevates professional image.

Practice demonstrates that Evernote application in operating rooms improves surgical cooperation quality, enhances nurses' specialized comprehensive ability, and reduces adverse events. This approach suits large general hospitals with multiple specialties and high surgical volumes, as well as smaller primary hospitals with single surgical types. Informatization of operating room training and management represents a modern development trend, and leveraging powerful, practical applications to improve nursing quality warrants continued exploration in the context of high specialization versus multi-competency requirements.

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Conflict of Interest Statement: The authors declare no conflicts of interest.

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