



## **Facilitating nursing processes by information technology during COVID-19: A systematic review**

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### **Abstract**

**Objective:** In late 2019, with the outbreak of Covid 19, China began the first level of public health and emergency response. "Internet plus nursing services" is registered for the use of nurses in medical centers based on information technology "online program, offline services", which refers to the provision of nursing services for home patients or patients after discharge. The purpose of this article is to classify and identify information technology that facilitates nursing processes.

**Methods:** This research is an applied study that was conducted in 1399 by systematic review method. Using the keywords of information technology, nurses, nursing process, corona virus and COVID-19 were performed in various databases such as PubMed, ScienceDirect and Google scholar in the last two years from early 2019 to the end of 2020 (2020-2019).

**Results:** In this study, 211 English articles were found which were included in the study after reviewing 9 articles. The most satisfactory platform from the users' point of view (91%) The IT platform for "Internet plus nursing services" is a Wechat mini program that was developed and used in early 2019.

**Conclusion:** Prior to the COVID-19 epidemic, "Internet plus nursing services" was performed using online appointments and offline home visits to provide nursing services to patients.

**Keywords:** Information Technology, Nurses, Nursing Process, Corona Virus, COVID-19.

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### **I. Introduction**

It is hard to imagine health care without information and communication technology. [1-3] Information technology has existed in healthcare for about 4 decades and has gained wide application. Information technology affects the provision of patient care and its use is limited to improve the quality of clinical staff decision-making and the quality of medical services. Therefore, the tendency to use information technology in the clinical field, especially nursing, to facilitate processes has increased and it is

expected that this technology will allow clinical services to be provided at the lowest cost. Information technology in hospital settings in the form of clinical information systems have significant effects on improving clinical processes and patient satisfaction. [4-7]

At the beginning of the third millennium, information technology has emerged as the major axis of change and development in the world. Advances in information technology in recent decades in the world have created important opportunities for nurses to be aware of the condition of patients with covid-19, and this has

led to new roles for nurses and increase their decision-making power in nursing care. [8-11] Therefore, nurses need to increase their knowledge and awareness for proper information management. [2, 12] Due to the lack of a review article on the classification of the use of information technology in nursing in the last two years, this study can provide a good view for nurses and therapists to use the best information technology during the covid-19 epidemic to change the trend in The field of nursing in the world, especially in Iran, should be developed due to the expansion of the use of information technology methods in nursing.

The nursing process is a framework for planning and implementing nursing care for the patient and his family, which consists of related, dynamic, continuous, scientific and problem-oriented activities. In other words, the nursing process is an organized method of care that emphasizes the diagnosis and treatment of reactions of individuals or groups to potential and actual problems and includes 5 stages of review, nursing diagnosis, care planning, implementation and evaluation of nursing measures. [2, 12-16]

Given the importance of information technology in health care, it is necessary to describe the most used nursing technologies in the field of nursing. Also, the interrelationships between decision-making nurses and technology related to the profession should be considered. [17-21]

Application of technology and computer system for collecting, storing, processing and modifying related data in the field of nursing care can facilitate the provision of nursing services, enable resource management and nursing care, and support training resources for nursing education. [17, 20, 21] In the years when the concept of information technology in nursing has been introduced, the role of nurses in nursing care and in information technologies has expanded. The use

of the Internet, especially during the COVID-19 epidemic, has enabled the nursing community to communicate with each other over long distances, to disseminate their information on health care, and to provide health information to patients. In such a way that patients can use computers to obtain information at home, while before the introduction of covid-19, more attention was paid to the indirect role of patients in maintaining health. Therefore, there is a need for more knowledge about the use of information technology for health care providers. [22, 23] The purpose of this study is to classify and identify information technology that facilitates nursing processes.

### **Materials and methods**

PubMed, Science Direct and Google scholar were used to find studies and resources related to the use of information technology in the field of nursing to facilitate nursing processes. English articles were searched from early 2019 to late 2010 using the keywords Information Technology, Nurses, Nursing Process, Corona Virus, and COVID-19.

These words were often used separately and in some cases as a combination of two words. Due to the fact that there was no specific time limit at the beginning of the search, most of the relevant articles extracted were related to the mentioned years. Incoming and outgoing articles are reported using the PRISMA flowchart [24] in Figure 1. About 211 titles were found and duplicate titles were removed. Emphasis was placed on empirical and review studies in the field of information technology in nursing. Finally, 9 articles were reviewed to review the literature on the application of information technology in nursing.

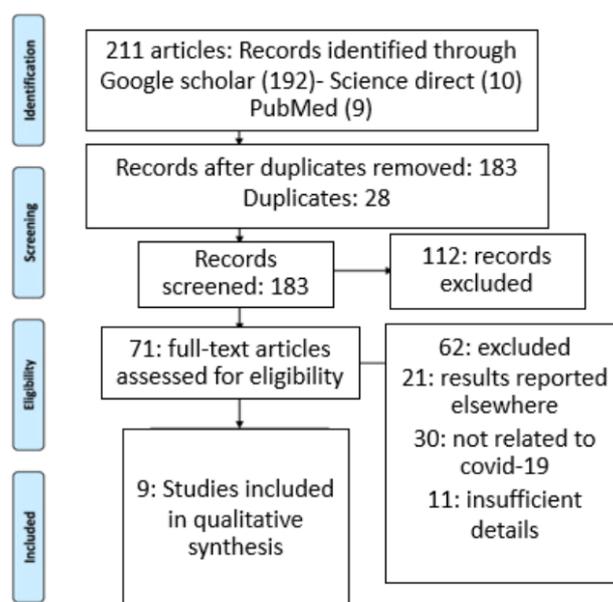


Fig 1: PRISMA flowchart

## Results

In this study, 211 English articles were found, which after a complete review of the texts, 9 articles were included in the study. The technologies that have been effective in facilitating the nursing process in the last two years are categorized in Table 1, which Wechat Mini Program is the most satisfactory platform from the users' point of view (91%). It was developed and used in early 2019. [9, 25] The program uses

counseling and requests for home visit services and health education that patients can use directly through Wechat Mini Program by scanning a quick response code (QR code) or using the search function of an online appointment. After reading and checking the informed consent box, patients can request a home visit. [26]

Table 1: Classification of widely used information technology in the field of nursing during covid-19

Row	Technology names	Application	Country
1	Wechat Mini Program	Follow-up visit	China
2	COVIDSafe	helps identify people exposed to (COVID-19)	Australia
3	Corowarner	Contact tracing	Turkey
4	Corona 100m	Contact tracing symptom monitoring, and information	South Korea
5	Home Quarantine	Capturing a selfie	Poland
6	Private Kit: Safe Paths	Contact tracing symptom monitoring, and information	UK
7	Rakning C-19	Contact tracing	Iceland
8	MyTrace	Contact tracing symptom monitoring, and information	Malaysia
9	TraceTogether	Contact tracing	Singapore

### Contact tracing technologies

There are different of contact tracing technologies (66% of articles) during covid-19 for helping nurses. China is the first country to run an app specific for contact tracing by using tracking and surveillance techniques. [27] These contained tracking of infected individuals and their contacts, while others were allowed to carry on with their usual lives. Malaysia, Singapore, India, Indonesia, and Iceland were next at running individual apps for contact tracing.[28]

### Information providing technologies

Many governmental organizations and health agencies have used social media platforms to start the connection between nurses and patients, like Facebook, WhatsApp, Instagram, and Twitter to provide specific information about COVID-19 to the public.[29] Although these platforms have app functionalities, Facebook, Instagram, and Twitter can be used on a browser. WhatsApp has been widely popular and is one of the main methods of providing information and connection on COVID-19 in many countries. These platforms can make the nurses' processes for connection to the patients easier than before.[22, 24, 30, 31]

### Discussion

From this systematic review, contact tracing, monitoring the symptom, and information providing technologies were the key types of technologies that had been developed for the management of COVID-19, with the majority being developed by health organizations and governments.[23, 32, 33]

Most of the technologies identified from this systematic review were for contact tracing. These technologies were developed to facilitate the connection between nurses and patients to make the process easier.[16, 20, 31, 34-36] These nine technologies that are categorized in table 1 were user friendly and designed to ensure that most of the nurses understood the application and used it effectively.

Davalbhakta and et al showed that the apps accessed from Europe/ North America remained focused on information and less use for nurses. Though high quality and from credible sources, they often lacked creative or interactive methods to portray this information. [17]

Alexopoulos also showed that Mobile health apps are becoming increasingly popular amongst users who are turning to digital platforms to aid their mental wellbeing.[5]

In 2019, the National Health Commission of China proposed a pilot project "Internet plus nursing services" with the aim of public health, innovation of nursing services, expanding the supply of services and accurate satisfaction of diverse and multilevel health needs of the people. Under the

COVID-19 epidemic, the provision of nursing services to patients using the Internet plus nursing services is in line with government-sponsored online diagnosis and treatment counseling services.

In addition, the implementation of "Internet plus Nursing Services" provides a comprehensive assessment of patients and provides services to patients in a variety of ways. Not only can it meet the needs of home patients suffering from the disease. Rather, it effectively removes the burden of prevention and control of medical institutions. It also reduces the risk of cross-infection of patients and their families when traveling to the hospital, which plays an important role in preventing and controlling COVID-19. COVID-19 is currently expanding worldwide. In order to control the epidemic, the "Internet plus Nursing Services" mode can be referred by peers.[37]

Our analysis shows that IT, specifically through contact- tracing technologies, can be effective in facilitating the nurses' processes during the COVID-19.

Our systematic review managed to identify certain technologies that can facilitate the nurses' processes. Given the high rates of social media use, using social media channels to provide factual COVID-19. By combining with other features, a multipurpose technologies that provides all information and services about COVID-19 will potentially be attractive to users and the public.

### Conclusion

This systematic review has identified a variety of technologies that may be potentially useful to facilitate the nurses' processes by using the technologies during the spread of COVID-19. The majority of the technologies were for the purposes of contact tracing and symptom monitoring. However, these technologies, especially those for contact tracing, can be effective if they are advocated by the government and taken up by the community. Governments can also benefit by encouraging their nurses and citizens to use these technologies during the pandemic. In addition, the sharing of good practices across different countries with new technologies can enable governments to learn from each other so that effective strategies to combat and manage this pandemic can be developed to control the spread of the coronavirus.

**Conflicts of interest:** There is no Conflicts of interest.

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