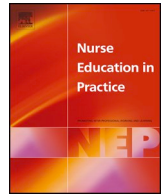




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Guest Editorial

Coronavirus disease (COVID-19) prevention: Virtual classroom education for hand hygiene



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ABSTRACT

Coronavirus disease (COVID-19), has spread rapidly in Asia, Europe, the Middle East and the Americas. Considering the recent outbreak of COVID-19, some precautionary measures have been announced, including campus class suspensions. Nursing campus courses have also been suspended, and there may be a learning gap between hand hygiene theory and clinical training for nursing students. A virtual classroom education approach may help address the learning gap by providing ongoing theoretical strengthening of hand hygiene during clinical nursing training. This editorial proposes a 3-step virtual classroom education approach to support nursing educators in online theoretical hand hygiene enhancement.

Hand hygiene can reduce the spread of pathogenic microorganisms to patients and healthcare workers (WHO, 2009). Campus class suspension is a precautionary measure for COVID-19, however, the suspension limits nursing educators' support for nursing students' knowledge of hand hygiene. Virtual classroom education can be an alternative method for nursing educators to enhance continuous hand hygiene teaching. Online teaching and learning can be held through the virtual classroom. This editorial may provide a feasible approach for nursing educators to enhance hand hygiene for clinical nursing students. A quasi-experimental study found that strengthening hand hygiene knowledge for nursing students can address the gap between hand hygiene theory and practice during clinical training (Korthonen et al., 2018). A blended learning (campus and online) approach (Ng and Yip, 2019) is modified to virtual classroom education. As nursing students have learned hand hygiene theory through campus learning, this modified approach extends online instruction and skips face-to-face instruction on campus. The modified approach is designed to help nursing educators conduct virtual classroom education in three steps: 1. Plan appropriate tasks, 2. Select essential resources and 3. Perform effective delivery.

1. Step 1. Plan appropriate tasks

Having a collaborative planning prevents potential mismatches in expectations and priorities between nursing educators and nursing students. The planning team includes nursing educators and nursing students to design of content and activity plans for meeting the various needs of nursing students. When a nursing educator starts a virtual classroom program, a specific scope of teaching tasks will be suggested. For example, a task of hand hygiene: when, how and why. The planning team can review the following questions to evaluate teaching tasks:

- 1) What is the content (specific scope) of a hand hygiene task?
- 2) What is the learning mode (video or e-notes) for hand hygiene?
- 3) Do all parties (educators and students) support the task of hand hygiene?

These questions can reflect teaching content, learning modes and the task of educators and students in preparing the necessary hand hygiene resources.

2. Step 2. Select essential resources

Nursing educators need to upload teaching materials including reading materials, handouts and videos. There are many resources in the electronic platform such as World Health Organization (WHO, 2009). In addition, local health organizations also provide useful information, such as Centre for Health Protection, Hong Kong. Website of Centre for Health Protection, Hong Kong (<https://www.chp.gov.hk/en/healthtopics/content/460/19728.html>) displays hand hygiene videos, pamphlets, booklets and posters in various fields (for example, at home, schools, clinics and hospitals) to help healthcare workers promoting hand hygiene (for example, washing hands with soap and water, and rubbing hands with alcohol-based hand lotion). These essential resources can help nursing educators build electronic libraries by selecting relevant materials to match current hand hygiene courses for enriching previous campus teaching.

In the step of selecting the necessary resources, nursing educators can reassess three reviewing questions in step 1. The first question can reflect what the specific scope of hand hygiene is, such as the different aspects between hand sanitization and washing hands with soap and water. The second question can help nursing educators choose a learning mode. For example, instructional videos can provide visual guidance to show when nursing students need to wash hands with soap and water instead of sanitizing hands with alcohol hand-rub. The third question is to determine possible arrangements in different situations, including the availability of equipment: water supply in ambulances. These questions can help decide the necessary resources by considering the content, mode and arrangements of the task.

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3. Step 3. Perform effective delivery

Online platforms such as Zoom ([zoomnow.net](https://zoom.us)) and Blackboard (blackboard.com) provide online platforms on mobile phones, laptops and computers for online seminars, conferences and presentations. The online platform expands traditional classrooms into virtual classrooms through technology. Nursing educators deliver online teaching for nursing students through online platforms, enabling nursing students to receive school announcements in a virtual classroom, discuss and display collaborative works synchronously. For example, a nursing educator can discuss the time needed to wash hands with soap. Students can display their answers, and the educator can provide immediate feedback to students.

If all students are self-disciplined, then virtual classroom education can improve student learning outcomes. Considering self-discipline, Ng and Yip (2019) recommend that all participants should follow mutually agreed rules to respect nursing educators and students. As a result, nursing educators can provide nursing students with study guides, including the structure of virtual classrooms and how students expect to interact with the educators and other students. Nursing students should follow study guides to participate in learning activities. Nursing educators also regularly check nursing students' on-line participation. Feedback on the progress of nursing students ensures that students make progress towards achieving individual or group learning goals. To assess learning outcomes of hand hygiene, Korthonen et al. (2019) developed a multi-component hand hygiene intervention (MCHHI). MCHHI has 17 questions, such as 'hand disinfection is not needed before donning gloves' and 'hand should be disinfected after touching the patient's immediate surroundings' (ibid). Nursing students can use MCHHI to evaluate learning outcomes through self-assessment and peer assessment.

This virtual classroom approach is a design for an online environment that provide real-time interaction between nursing educators and nursing students. Nursing educators can plan, prepare and perform hand hygiene reinforcement during suspensions of on campus learning. Whether novice and experienced nursing educators, this 3-step approach can be used to enhance the hand hygiene of clinical nursing students. Hand hygiene is very important to health care professionals. This virtual classroom approach can be applied to nursing education and other health care education such as medical education, physiotherapy education and occupational therapy education. As the rapid growth of tandem transportation has reached an unprecedented level of global connectivity with the disaster regions. Some preventive measures against COVID-19 have been announced in the affected countries including campus course suspensions. Applying this virtual classroom approach to countries where campus classes are suspended will be an

alternative method to enhance hand hygiene.

The authors' contribution to editorial

All the authors contributed to the planning, drafting and revision of this editorial.

Declaration of competing interest

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