



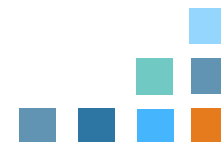
COVID and aged care: Gamification of infection control training

WHO CC Webinar 2022

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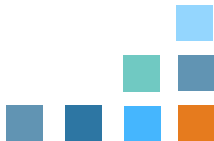
Acknowledgment:

The project is funded by Health and Medical Research Fund - Commissioned Research on the Novel Coronavirus Disease (COVID-19), Food and Health Bureau, The Hong Kong SAR government (reference no.: COVID190218).



Presentation outline

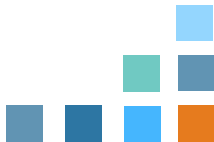
1. Infection control in Residential Care Homes
2. Blended Gaming COVID-19 Training System (BGCTS)
 - Rationale for developing this system
 - System design/ development
3. Pilot test
 - Arrangement of the pilot test
 - Results of the pilot test
4. The way forward





Background

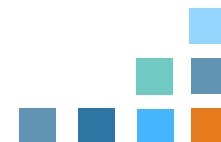
- Training the staff in residential care homes (RCHs) is crucial because they are the gatekeepers of the safety of the residents.
- In Hong Kong, a registered nurse is designated as an Infection Control Officer (ICO)
 - coordinate matters related to the prevention and handling of infectious diseases in each RCH.
- Many RCH staff have difficulty to understand the written guidelines.
- Gamification refers to “the use of game design elements in non-game contexts”. (Deterding et al., 2011)
 - short video clips
 - interactive video games in the form of quizzes
- non-game environments (RCHs) within non-game contexts (infection control training)
- Gamification is widely used as an educational tool in different disciplines (Vlachopoulos & Makri, 2017)





Blended Gaming COVID-19 Training System (BGCTS)

- The BGCTS is **the first of this kind training**, addressing the diverse **health literacy** and helping RCH staff to comply with **WHO infection control guidelines**.
- It brings benefits to the society in terms of knowledge development and practice improvement.





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BGCTS - Design

The contents are based on WHO guideline (WHO, 2020)

There are 8 posters:

- 1 poster = 1 game/story

Stories were set with referent to usual practices in RCH.

Hosted by the secured web server

The COVID-19 Risk Communication Package For Healthcare Facilities



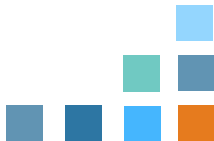
This package provides healthcare facility management and healthcare workers with an overview of the key actions required to keep safe and healthy in the workplace.

Updated March 10, 2020.

This toolkit is designed to be easily edited, printed and shared. The layout is suitable for any ISO-sized paper (A4, A3, A2).

Images and text have been separated so the layout can be adjusted depending on the requirements.

To print, export the files as PDF or PNG and send to the printer. For borderless printing, the image may be scaled to fit the printable area and trimmed along the edges.





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BGCTS - Login Page

- Unique username and password will be assigned to each RCH staff
- Progress checking
- System features:
 - Implementation of check-point: users can continue where they have stopped
 - Allows repeated attempts on the games
 - Compatible with PC/ IOS & Android system

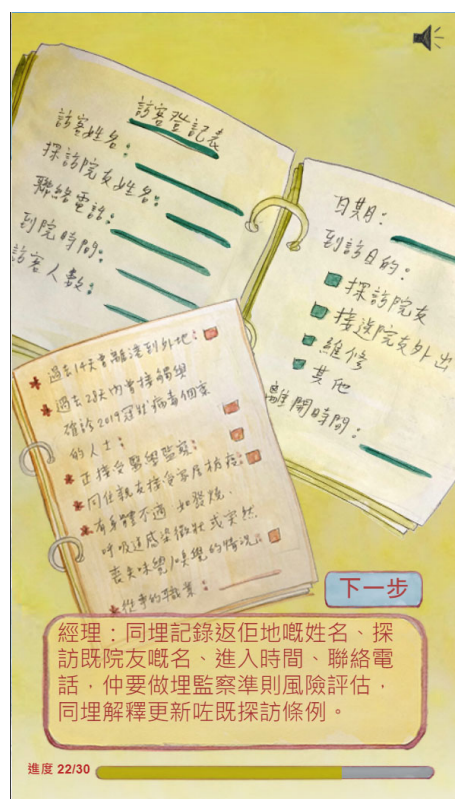
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BGCTS - Introduction, Story 1-3



Novel Coronavirus COVID-19 FOR: HEALTHCARE FACILITY MANAGEMENT
Preparing for COVID-19 at your healthcare facility

Have a triage station at the healthcare facility entrance, prior to any waiting area, to screen patients for COVID-19. This limits potential infection throughout the health care center.

Post information, like posters and flyers, that remind patients and visitors to practice good respiratory and hand hygiene.

Prepare a well-defined and separate waiting area for suspected cases.

Have alcohol-based hand rub or soap and water handwashing stations readily available for the use of healthcare workers, patients and visitors.

Be alert for anyone that may have symptoms such as cough, fever, shortness of breath, and difficulty breathing.

Protect your workforce
Be ready! Ensure your healthcare and triage workers:

- Are trained on the importance, selection and proper use of personal protective equipment
- Are trained to spot symptoms of a potential COVID-19 infection and offer a medical mask to suspected cases
- Know the case definition and have a decision flow diagram available and accessible for reference at the triage station
- Isolate a suspected case promptly
- Perform hand hygiene frequently

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- How to facilitate learning
 - With voice-over
 - Progress bar to indicate progress
- Introduction
- Story 1
 - Preparing for COVID-19 at your healthcare facility
 - Highlighted areas:
Triage procedures, social distancing and suggested policy for visiting hours.

BGCTS - Introduction, Story 1-3

Novel Coronavirus COVID-19
FOR: HEALTHCARE WORKERS
Protecting yourself at work from COVID-19

Follow the guidance of your healthcare facility management and talk to your colleagues about agreed COVID-19 safety procedures

When entering a room with a suspected or confirmed COVID-19 patient, put on:

- disposable gloves
- a clean, long-sleeve gown
- medical mask that covers your mouth and nose
- eye protection such as goggles

Remember Personal protective equipment should be changed between use and for each different patient. If utilizing single-use personal protective equipment (e.g. single-use masks, gloves, face shields) dispose in a waste bin with a lid and wash your hands thoroughly. Anything single-use cannot be reused or sterilized.

If performing an aerosol-generating procedure, such as intubation, use a particulate respirator such as an N95 – **do a seal check!**

Boots and coverall suits are not required

Remember Don't touch your eyes, nose or mouth with gloves or bare hands until proper hand hygiene has been performed.

If you start coughing, sneezing or develop fever after you have provided care, report your illness immediately to the concerned authority and follow their advice.

My 5 Moments for Hand Hygiene
Use alcohol-based hand rub or wash hands with soap and water:

1. Before touching a patient
2. Before engaging in clean/aseptic procedures
3. After body fluid exposure risk
4. After touching a patient
5. After touching patient surroundings

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WHOWHO WHO

護士長：又或者戴住手套，就以為好安全，周圍咁掂，周圍拎嘢，其實係最危險㗎。會將啲病毒帶到去其他地方。

進度 100%

• Story 2

- Managing patients with suspected or confirmed COVID 19 at your healthcare facility
- Highlighted areas:
Handling of suspected or confirmed cases of COVID-19 and environmental cleaning

• Story 3

- Protecting yourself at work from COVID-19
- Highlighted area: Proper use of PPE

BGCTS - Story 4

Personal Protective Equipment (PPE) According to Healthcare Activities



- To introduce the appropriate use of PPE in the context of COVID-19

- 5 scenarios

- Points-of-entry screening personnel
- Collecting respiratory specimens
 - Caring for a suspected/confirmed case of COVID-19 with
- NO aerosol generating procedure
- Aerosol generating procedure
- Transport and involve direct care



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BGCTS - Story 5

Communicating with patients with suspected or confirmed COVID 19

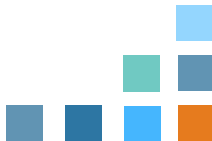


- To introduce appropriate communication techniques when communicating with patients with suspected or confirmed COVID 19

- Visual novel-based adventure

- Being the RCH staff, the participant chooses the best response to communicate with others in 3 different scenarios
- Various communication techniques will be introduced if answered incorrectly

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BGCTS - Story 6

Information sheet about COVID-19



Novel Coronavirus COVID-19 FOR HEALTHCARE FACILITY PATIENTS AND VISITORS
Information sheet about COVID-19

5 Things to Know

What is COVID-19?
COVID-19 is a disease caused by a new coronavirus, which has not been previously identified in humans. Coronaviruses are a large family of viruses found in both animals and humans.

What are the symptoms of COVID-19?
In most cases, COVID-19 causes mild symptoms including a runny nose, sore throat, cough and fever. It can be more severe for some people and can lead to pneumonia or breathing difficulties. In some cases, infection can lead to death.

How does COVID-19 spread?
COVID-19 appears to spread most easily through close contact with an infected person. When someone who has COVID-19 coughs or sneezes, small droplets are released and, if you are too close, you can breathe in the virus.

Who is most at risk?
We still need to learn more about how COVID-19 affects people. Older people, and people with other medical conditions, such as diabetes and heart disease, appear to be more at risk of developing severe disease.

What is the treatment for COVID-19?
There is no currently available treatment or vaccine for COVID-19. However, many of the symptoms can be treated.

5 Things to Do

Wash your hands frequently.
Wash your hands with soap and water or if your hands are not visibly dirty, use an alcohol-based hand rub. This will remove the virus if it is on your hands.

Cover your mouth and nose with a flexed elbow or tissue when coughing and sneezing.
Throw away the used tissue immediately and wash your hands with soap and water or use an alcohol-based hand rub. This way you protect others from any virus released through coughs and sneezes.

If possible, keep a distance of 1-metre between yourself and someone who is coughing, sneezing or has a fever.
COVID-19 appears to spread most easily through close contact with an infected person.

Avoid touching your eyes, nose and mouth.
Hands touch many surfaces which can be contaminated with the virus. If you touch your eyes, nose or mouth with your unclean hands, you can transfer the virus from the surface to yourself.

If you have fever, cough AND difficulty breathing, seek medical care. Phone ahead and inform the health center when you will visit.
Always follow the guidance of your health care professional or national health advisories.

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- To enhance participants' knowledge towards COVID-19
 - 40 MC questions
 - Wrong answers: increase number of Coronaviruses by 1
 - Correct answers: Protagonist would fence off Coronaviruses
- Aspects of COVID-19 covered:
 - Sign and symptoms
 - Environmental cleaning
 - Preventive measures
 - Means of transmission
 - Hand and respiratory hygiene

BGCTS - Story 7

Coping with stress

- To introduce appropriate ways of stress coping
 - Each bubble represent one stress coping technique
 - Drag appropriate bubble to “feed” protagonist
 - Correct answers would:
 - increase marks
 - brighten the facial expression of protagonist
 - Goal: obtain as many marks as possible in 120 seconds





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BGCTS - Story 8

My 5 Moments for Hand Hygiene



Story 8

- To introduce different Hand Hygiene opportunities and its techniques
- Videos appraisal & Point and click adventure
 - Incorporated all 5 moments into 4 scenarios
 - Participants are required to properly perform hand hygiene before advancing the story



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Pilot Test of BGCTS

- Using Zoom to go through the pages one by one.
- RCH healthcare personnel involved:
 - 2 Health workers
 - 1 Enrolled nurse
 - 2 Registered nurse
 - 1 Nursing Officer

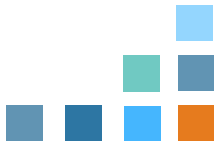




Pilot Test of BGCTS

- Cognitive interview was used to:
 - Explore & gain insight on participants' cognitive process upon using BGCTS
 - identify possible improvements
- Techniques were used:
 1. Retrospective probing (questions asked after the trial)
 2. Concurrent verbalization (think aloud)
- Probing questions:
 - How effective would you think BGCTS can improve your (COVID-19) infection control knowledge?
 - Which function/ story do you like the most? Why?
 - To further enhance RCH staffs' infection control knowledge, how can BGCTS be improved?
 - Is there any difficulties you have encountered? How can the system be modified?

(Pepper et al., 2018)





BGCTS - User Acceptance Test

- System Usability Scale (SUS)
 - John Brooke (1995)
 - An addition adjective-anchored Likert scale item has been added by Bangor et al. (2009)
 - Chinese version translated by Wang and colleagues (2020)
- Scoring of pilot test:
 - Mean score of usability scale= 67.1/100
 - Mean score of user-friendliness (7-point Likert scale) = 5.5

System Usability Scale

© Digital Equipment Corporation, 1986.

	Strongly disagree					Strongly agree	
1. I think that I would like to use this system frequently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		4
2. I found the system unnecessarily complex	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1
3. I thought the system was easy to use	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		1
4. I think that I would need the support of a technical person to be able to use this system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		4
5. I found the various functions in this system were well integrated	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		1
6. I thought there was too much inconsistency in this system	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		2
7. I would imagine that most people would learn to use this system very quickly	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		1
8. I found the system very cumbersome to use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		1
9. I felt very confident using the system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		4
10. I needed to learn a lot of things before I could get going with this system	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		3

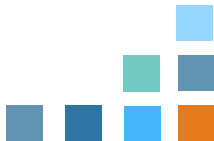
11. Overall, I would rate the user-friendliness of this product as:

<input type="checkbox"/> Worst Imaginable	<input type="checkbox"/> Awful	<input type="checkbox"/> Poor	<input type="checkbox"/> OK	<input type="checkbox"/> Good	<input type="checkbox"/> Excellent	<input type="checkbox"/> Best Imaginable
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Results of the pilot test

- More than 30 suggestions have been identified
- Notable comments:
 - Consider to add a story before answering the MC questions
 - > Story 3: MC questions should be added at the end of each session
 - Too many visual cues on Story 8
 - > Decreased frequency of visual prompting, allowing users to identify appropriate Hand Hygiene opportunities
- Other improvements on BGCTS:
 - Enhance user-friendly features and presentation format
 - Increase volume of voice over & font size
 - Add user instructions while the users navigate the system
- In general, users described BGCTS as:
 - This system is 'Informative and motivational' for learning infection control practices
 - Refer animations as 'attractive'
 - Consider the games as 'interesting and educational'
 - Describe the experience as "fun and engaging"



The Way Forward

A Cluster RCT

邀請參與研究 提高安老院員工對感染控制措施 的知識和能力

我們正研製一個感染控制培訓系統 (BGCTS)，以遊戲及面授混合模式指導安老院員工學習感染控制措施，防止COVID-19的傳播、提升感染控制的知識和應對能力。現在我們邀請您來測試這個系統。

參與研究的人士：
任何直接提供護理程序的員工均可參與，包括：

專業人士：醫生、註冊護士、註冊精神科護士、
登記護士、物理治療師、職業治療師等

前線員工：醫護支援人員、保健員、個人護理員、
照顧員、物理治療助理、職業治療助理

項目主要研究員：
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世界衛生組織社區衛生服務合作中心副主任

整個培訓計劃費用全免



查詢或註冊，請掃描：



如有興趣或任何查詢：
請聯絡 劉先生
電話：3400 8295
電郵：terence.lau@connect.polyu.hk

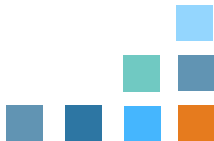
該項目由香港特別行政區政府食物及衛生局衛生及醫學研究基金 - 新型冠狀病毒病 (COVID-19) 委託研究資助 (參考編號：COVID190218)。

Aims: To assess the effect of the Blended Gaming COVID-19 Training System (BGCTS) on infection control practices among all staff in RCHs.

Intervention:
2-week blended training =
Eight 15-min e-learning (total 120 min.) + two 30-min face-to-face group sessions with Infection Control Officer

Reference

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Thank you

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