1
00:00:04,440 --> 00:00:05,520
Hi everyone.

2
00:00:05,520 --> 00:00:07,240
Thanks for tuning in to the NUS

3
00:00:07,240 --> 00:00:11,040
Nursing Research Podcast series
where we feature the latest works

4
00:00:11,040 --> 00:00:12,480
of our brightest minds.

5
00:00:12,480 --> 00:00:17,080
I'm Dr. Jocelyn Chew, a research fellow
at the Center for Nursing Studies.

6
00:00:17,880 --> 00:00:19,240
Here with us today is

7
00:00:19,240 --> 00:00:22,520
Dr. Chua Wei Ling,
a research fellow at the Alice Lee

8
00:00:22,520 --> 00:00:25,360
Centre for Nursing Studies,
National University of Singapore.

9
00:00:25,680 --> 00:00:29,320
She's passionate about improving
the recognition and response

10
00:00:29,320 --> 00:00:33,080
to deteriorating hospitalized patients,
as well as raising sepsis

11

00:00:33,080 --> 00:00:36,960
awareness and knowledge among health care
professionals and the general public.

12
00:00:37,400 --> 00:00:42,000
Dr Chua has presented her research work
in local and international conferences.

13
00:00:42,360 --> 00:00:45,000
Today, she'll be sharing about
how she teaches students

14
00:00:45,000 --> 00:00:48,600
to recognize and manage sepsis
using virtual reality.

15
00:00:49,240 --> 00:00:52,680
Our topic for today is recognizing
and managing sepsis

16
00:00:52,680 --> 00:00:57,160
through virtual reality and enhanced
active learning strategies,

17
00:00:57,160 --> 00:00:58,200
where Dr. Chua shares

18
00:00:58,200 --> 00:01:02,040
about how she conducts sepsis education
using a game based learning approach.

19
00:01:02,360 --> 00:01:03,480
We will also talk about

20
00:01:03,480 --> 00:01:07,200
how this is generally a more productive
than didactic teaching.

21
00:01:07,440 --> 00:01:10,320
All will be also known
as traditional classroom teaching.

22
00:01:11,200 --> 00:01:14,320
Hi Wei Ling! It feels so refreshing
to have this conversation with you

23
00:01:14,320 --> 00:01:15,000
now, you know,

24
00:01:15,000 --> 00:01:15,840
because we are normally

25
00:01:15,840 --> 00:01:17,760
just talking
along the corridors in the office

26
00:01:17,760 --> 00:01:20,160
and never like really outside of office,
right?

27
00:01:20,400 --> 00:01:20,840
That's right.

28
00:01:20,840 --> 00:01:22,320
So thank you for having me, too.

29
00:01:22,320 --> 00:01:24,200
Is a pleasure to be here today.

30
00:01:24,200 --> 00:01:25,080
Thank you.

31
00:01:25,080 --> 00:01:26,240
So maybe before we start,

32
00:01:26,240 --> 00:01:28,920
you can share a little bit
more about yourself and what you do.

33
00:01:29,400 --> 00:01:30,640
Hi, everyone.

34
00:01:30,640 --> 00:01:31,200
I'm Dr. Chua Wei Ling

35
00:01:31,200 --> 00:01:38,160
a Research Fellow at the Alice Lee Centre for Nursing Studies, National University of Singapore.

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00:01:38,160 --> 00:01:41,920
One of my research area has to do
with improving the understanding

37
00:01:41,920 --> 00:01:46,520
and awareness of sepsis among health care
professionals and health care students.

38
00:01:46,760 --> 00:01:49,080
So we keep hearing the word “sepsis”, right.

39
00:01:49,120 --> 00:01:51,480
Can you share with us a little bit more
about what it means?

40
00:01:51,520 --> 00:01:51,720
Okay.

41
00:01:51,720 --> 00:01:55,560
So basically, sepsis
is a serious complication of an infection

42
00:01:55,800 --> 00:02:00,920
which can lead to multiple organ
failure and death, if not treated quickly.

43
00:02:00,920 --> 00:02:04,320
Fever or low body temperature,
chills and shivering

44
00:02:04,560 --> 00:02:07,920
or fast heartbeat, confusion
or disorientation,

45
00:02:08,160 --> 00:02:12,640
shortness of breath and fast
breathing, extreme pain or discomfort.

46
00:02:12,880 --> 00:02:16,960
These are some of the symptoms of sepsis,
a life threatening and term

47
00:02:17,000 --> 00:02:21,400
critical medical emergency
that has a mortality rate of 30

48
00:02:21,400 --> 00:02:25,120
to 45% and kills
11 million people each year.

49
00:02:25,480 --> 00:02:26,960
So, in fact, most cases of

50
00:02:26,960 --> 00:02:31,360
sepsis are avoidable and treatable,
and early identification

51
00:02:31,360 --> 00:02:35,400
with expeditious intervention

is key to successfully treating it.

52
00:02:35,880 --> 00:02:40,720
So in relation to a hospital setting,
we educate our students by training them

53
00:02:40,720 --> 00:02:43,560
how to recognize and respond to sepsis

54
00:02:43,880 --> 00:02:48,000
and focusing on the early diagnosis
and management of sepsis.

55
00:02:48,640 --> 00:02:50,400
So it seems like the key to

56
00:02:50,400 --> 00:02:54,200
this problem is actually to detect
and treat sepsis early, right?

57
00:02:54,520 --> 00:02:56,240
Yes, we really need to nip it in the bud.

58
00:02:56,240 --> 00:02:59,760
Sepsis is a serious complication
of an infection.

59
00:03:00,080 --> 00:03:04,320
It sets in when the body develops
an extreme response to infection,

60
00:03:04,600 --> 00:03:09,720
damaging its own tissues and causing
organs to function poorly or abnormally.

61
00:03:10,080 --> 00:03:14,320
So without timely treatment,

sepsis can rapidly lead to tissue damage,

62
00:03:14,720 --> 00:03:19,080
organ failure and death, even though
it usually starts in the lungs.

63
00:03:19,080 --> 00:03:22,320
Urinary tract, skin
or gastrointestinal tract,

64
00:03:22,600 --> 00:03:25,760
anyone can get an infection,
and almost any infection,

65
00:03:25,760 --> 00:03:29,160
including our COVID
19 virus, can lead to sepsis.

66
00:03:29,520 --> 00:03:34,440
However, some people are at a higher risk
for sepsis, such as individuals

67
00:03:34,440 --> 00:03:37,840
with a weakened immune system
the elderly or infants,

68
00:03:38,240 --> 00:03:42,560
those with underlying medical conditions
such as heart or lung conditions,

69
00:03:42,920 --> 00:03:46,800
cancer,
diabetes, liver or kidney diseases.

70
00:03:47,120 --> 00:03:50,640
Those with severe illness
or have been hospitalized due

71
00:03:50,640 --> 00:03:52,640
to severe COVID 19, for example.

72
00:03:53,080 --> 00:03:58,600
Also, people who survive sepsis
are at higher risk of developing sepsis,

73
00:03:58,600 --> 00:04:00,000
so the incidence of sepsis

74
00:04:00,000 --> 00:04:03,320
will continue to rise
with the interplay of multiple factors.

75
00:04:03,600 --> 00:04:05,680
There are four that we look at, actually.

76
00:04:06,000 --> 00:04:09,080
The first is an aging population
because as people,

77
00:04:09,480 --> 00:04:13,320
the immune system become less effective
at fighting infections.

78
00:04:13,800 --> 00:04:18,520
This result in older people contracting
more infections and they are more severe.

79
00:04:19,040 --> 00:04:23,760
Every infection they get means they have
a higher risk of developing sepsis.

80
00:04:24,280 --> 00:04:27,800
Also, as people age,
they may develop chronic illnesses

81
00:04:27,800 --> 00:04:32,040
such as diabetes, COPD,
kidney disease or heart failure.

82
00:04:32,480 --> 00:04:35,480
This increases their susceptibility to sepsis.

83
00:04:35,920 --> 00:04:39,720
A second group of people who are prone to
sepsis are those who suffer

84
00:04:39,720 --> 00:04:44,760
predisposing co-morbidities,
which means that they have more than one

85
00:04:44,760 --> 00:04:49,000
serious health condition
and are generally more prone to infection.

86
00:04:49,440 --> 00:04:52,680
The third reason
for the increase in sepsis cases

87
00:04:52,680 --> 00:04:57,680
is the use of immunosuppressive therapy,
especially in cancer patients

88
00:04:57,800 --> 00:05:00,440
or patients with auto immune inflammatory

89
00:05:00,720 --> 00:05:03,680
conditions
to keep the immune system in check.

90
00:05:03,720 --> 00:05:07,880
However, this drug may weakened
the immune system, which causes them

91
00:05:07,880 --> 00:05:11,480
to be more susceptible
to complications from common infections.

92
00:05:12,200 --> 00:05:16,760
And lastly, they are very strong
strains of bacteria, viruses,

93
00:05:16,760 --> 00:05:20,920
fungi or parasites that are resistant to
medications used to treat them.

94
00:05:21,360 --> 00:05:27,960
As more germs become resistant to antimicrobial medicines
used to treat infections,

95
00:05:27,960 --> 00:05:30,440
more people are at risk for developing sepsis.

96
00:05:30,880 --> 00:05:33,640
So sepsis is recognized as a global health

97
00:05:33,640 --> 00:05:37,560
priority by the World Health Organization.

98
00:05:37,560 --> 00:05:41,880
The WHO has adopted a resolution
on improving the prevention,

99
00:05:42,240 --> 00:05:44,560
diagnosis and management of sepsis.

100
00:05:44,920 --> 00:05:48,640
So one effort we can do
is educating healthcare professionals

101
00:05:48,640 --> 00:05:53,200
on the early identification
and timely management of sepsis.

102
00:05:53,480 --> 00:05:57,640
So it seems so important that we train
and educate our young budding health

103
00:05:57,640 --> 00:06:01,200
care professionals in early detection
and management of sepsis.

104
00:06:01,400 --> 00:06:04,920
So how does your research actually tie
in with this?

105
00:06:05,640 --> 00:06:09,720
Yes, my team and I conducted several studies
on the recognition

106
00:06:09,720 --> 00:06:13,920
and management of sepsis among healthcare
professionals and students

107
00:06:13,920 --> 00:06:19,000
as a way to find out how to improve their
learning and understanding of this area.

108
00:06:19,600 --> 00:06:23,360
So we uncover an interesting
finding from our systematic review

109
00:06:23,360 --> 00:06:28,440
of 32 studies that sepsis, education
through an active learning approach.

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00:06:28,640 --> 00:06:34,080

Put simply learning-by-doing such
as simulation learning and game based

111
00:06:34,080 --> 00:06:39,800
learning generally produced greater gains
than traditional classroom learning.

112
00:06:40,440 --> 00:06:42,960
Because these methods provide learners
with hands-on

113
00:06:42,960 --> 00:06:47,480
clinical opportunities in a safe
and controlled patient environment,

114
00:06:47,720 --> 00:06:52,240
which is important to the learning
of complex clinical topics like sepsis.

115
00:06:52,320 --> 00:06:53,480
I can totally understand

116
00:06:53,480 --> 00:06:57,000
because I think some of our students
actually go in clinical attachment and

117
00:06:57,280 --> 00:07:02,160
they could possibly or potentially witness
such management of sepsis cases, but

118
00:07:02,160 --> 00:07:06,400
wouldn't have that much of an opportunity
to do some hands on on the management.

119
00:07:06,400 --> 00:07:11,200
So giving them this kind of virtual
reality learning experience would actually

120
00:07:11,200 --> 00:07:17,040
give them a safe environment to practice
or simulate this kind of management.

121
00:07:17,080 --> 00:07:18,120
Precisely.

122
00:07:18,120 --> 00:07:22,040
So this is why we want to improve learning
in a safe environment

123
00:07:22,040 --> 00:07:26,520
that we developed a program
using a virtual reality to teach students.

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00:07:26,760 --> 00:07:30,880
So together with my mentor, Associate
Professor Liaw Sok Ying, we developed

125
00:07:30,880 --> 00:07:35,960
the Sepsis, Inter-Professional Education
or in short the Sepsis IPE program

126
00:07:35,960 --> 00:07:39,360
for undergraduate medical
and nursing students at the NUS.

127
00:07:39,640 --> 00:07:44,120
So the program actually adopts a blended
learning approach with virtual reality.

128
00:07:44,520 --> 00:07:47,080
So in our program,
we built the student's knowledge

129
00:07:47,080 --> 00:07:50,520
by scaffolding,

the knowledge base starting with a self

130
00:07:50,920 --> 00:07:56,040
directed e-learning on team communications
skill strategies and sepsis care

131
00:07:56,040 --> 00:07:59,280
followed by a desktop virtual reality
simulation.

132
00:07:59,600 --> 00:08:03,360
So the virtual reality simulation
allowed the medical and nursing students

133
00:08:03,360 --> 00:08:07,680
to work together in a virtual world
that closely resembles a real

134
00:08:07,680 --> 00:08:12,840
clinical world in the delivery of team-based
care for patients with sepsis.

135
00:08:13,040 --> 00:08:14,040
So the self-directed

136
00:08:14,040 --> 00:08:17,840
learning activities provided students
with the prerequisite knowledge

137
00:08:17,960 --> 00:08:23,120
needed for the role play exercises through
the virtual simulated sepsis cases.

138
00:08:23,640 --> 00:08:28,200
So the learning mechanism for role-playing
exercises and reflection in virtual

139

00:08:28,200 --> 00:08:32,880
simulation promotes learning acquisition
and helps to deepen the student's

140
00:08:32,880 --> 00:08:37,480
learning by building connections
between the theory and clinical practices.

141
00:08:37,880 --> 00:08:42,000
So we also incorporated interactive
gameplay in the form of quizzes,

142
00:08:42,320 --> 00:08:45,600
scoring system
and time challenges to gamify

143
00:08:45,640 --> 00:08:49,840
the virtual simulation
so as to encourage participation.

144
00:08:50,240 --> 00:08:51,360
I think it sounds very fun

145
00:08:51,360 --> 00:08:55,280
that you actually inject some game
based component into your program, right?

146
00:08:55,520 --> 00:08:59,040
So I'm very interested to find out
more about your outcomes actually.

147
00:08:59,080 --> 00:08:59,360
Yeah.

148
00:08:59,360 --> 00:09:02,480
So we have tested the Sepsis IPE program on

149

00:09:02,480 --> 00:09:06,160
415 undergraduate medical
and nursing students

150
00:09:06,160 --> 00:09:09,960
to evaluate on the sepsis knowledge,
the team communication skills

151
00:09:09,960 --> 00:09:13,400
and how they apply the skills
in the clinical practice.

152
00:09:14,080 --> 00:09:17,600
So overall, students
who have undergone our program demonstrated

153
00:09:17,600 --> 00:09:22,360
a significant improvement in sepsis
knowledge and team communication skills.

154
00:09:22,800 --> 00:09:26,400
So in addition, the students
actually foster a better understanding

155
00:09:26,400 --> 00:09:31,120
and appreciation of each other's
interprofessional role in sepsis care.

156
00:09:31,240 --> 00:09:32,600
So this is also critical

157
00:09:32,600 --> 00:09:34,960
as you know,
we all need one another support.

158
00:09:35,200 --> 00:09:38,160
And looking after a patient
is always a team effort.

159
00:09:38,280 --> 00:09:40,680
Congratulations
on your very positive feedback.

160
00:09:40,720 --> 00:09:41,600
Thank you.

161
00:09:42,360 --> 00:09:46,200
So I'm curious did all this happened
during the COVID 19 pandemic period?

162
00:09:46,440 --> 00:09:47,520
Yes, it was.

163
00:09:47,520 --> 00:09:50,400
So actually, I must say that the COVID 19
pandemic actually

164
00:09:50,400 --> 00:09:53,640
gave a greater impetus
for the virtual simulation.

165
00:09:54,080 --> 00:09:56,160
Because, you know,
the COVID 19 has disrupted

166
00:09:56,160 --> 00:09:58,760
conventional in-person
simulation training.

167
00:09:59,120 --> 00:10:02,680
And we all know that virtual simulation
offers several advantages.

168
00:10:03,760 --> 00:10:07,960
You can assess it

anywhere, any time and it is cost effective

169
00:10:07,960 --> 00:10:10,480
and you can repeat aspects of the cases
you encounter.

170
00:10:10,960 --> 00:10:14,320
So in addition,
our students also give feedback that using

171
00:10:14,320 --> 00:10:17,760
virtual simulation
and gamification was a refreshing

172
00:10:17,760 --> 00:10:21,520
and fun way to learn about sepsis care
and the process

173
00:10:21,520 --> 00:10:24,320
of interprofessional teamwork
and communication.

174
00:10:24,720 --> 00:10:27,560
And what was also interesting
was that we discovered

175
00:10:27,560 --> 00:10:31,240
from our focus group discussions
with the students that adding

176
00:10:31,320 --> 00:10:35,040
a high fidelity simulation
after the virtual simulation

177
00:10:35,040 --> 00:10:39,160
would allow them to have a face
to face practice on critical skills

178
00:10:39,160 --> 00:10:44,040
like team dynamics, communication,
and hands-on clinical skills.

179
00:10:44,040 --> 00:10:47,040
So virtual simulation can be used as a bridge

180
00:10:47,040 --> 00:10:50,680
between the classroom
learning and high fidelity simulation.

181
00:10:51,080 --> 00:10:53,920
It helps learners to develop
critical reasoning,

182
00:10:54,240 --> 00:10:57,080
prioritization and decision making skills,

183
00:10:57,320 --> 00:11:01,360
which prepare them for a complicated
task in high fidelity simulation.

184
00:11:01,920 --> 00:11:05,640
So from this currently designing a program
to complement

185
00:11:05,880 --> 00:11:07,320
virtual reality learning,

186
00:11:07,320 --> 00:11:11,600
with a high fidelity simulation
component to enhance the long term

187
00:11:11,600 --> 00:11:15,360
retention of knowledge
and performance of clinical skills.

188
00:11:15,960 --> 00:11:16,120
Right.

189
00:11:16,120 --> 00:11:19,160
It's great to know that efforts
are actually underway to develop

190
00:11:19,160 --> 00:11:23,480
more interesting programs
for teaching and learning.

191
00:11:23,800 --> 00:11:26,680
Oh, I totally agree
that, you know, introducing

192
00:11:26,680 --> 00:11:29,760
these high fidelity simulations,
you know, by using mannequins

193
00:11:29,760 --> 00:11:33,640
and all of these could actually provide
even more real scenario

194
00:11:34,000 --> 00:11:37,960
for students to learn about
how to control sepsis or manage sepsis.

195
00:11:38,200 --> 00:11:41,520
Apart from virtual reality, I mean, like
you've mentioned, virtual reality help

196
00:11:41,560 --> 00:11:45,040
to breach the traditional classroom
teaching to high fidelity, right?

197
00:11:45,080 --> 00:11:48,360
So I think it makes a lot of sense

in a way.

198
00:11:49,160 --> 00:11:49,600
Yeah.

199
00:11:49,600 --> 00:11:52,520
So, yes, I know that
we enjoyed this feedback that you help us

200
00:11:52,520 --> 00:11:55,680
further improve on our Sepsis education
program.

201
00:11:56,560 --> 00:11:59,280
So besides researching on this area

202
00:11:59,280 --> 00:12:02,400
of sepsis management,
using this kind of tech based approach.

203
00:12:02,400 --> 00:12:05,440
What else
have you discovered in this area?

204
00:12:06,200 --> 00:12:06,480
Okay.

205
00:12:06,480 --> 00:12:10,280
So I'm currently working
with a group of like minded clinicians,

206
00:12:10,280 --> 00:12:18,360
who share similar interests in improving the care of patients with sepsis and supporting nurses in their roles in this aspect.

207
00:12:18,360 --> 00:12:25,360

In the healthcare system, nurses play a pivotal role in the early recognition and management of sepsis.

208
00:12:25,360 --> 00:12:27,960
You look at in the emergency department,

209
00:12:27,960 --> 00:12:33,320
triage nurses are often the first point of contact that
patients have with the health care system.

210
00:12:33,320 --> 00:12:38,360
And in the inpatient settings, nurses
are in a privileged position to identify

211
00:12:38,360 --> 00:12:45,400
hospital-onset sepsis at its earliest possible time because they have the most patient contact hours

212
00:12:45,400 --> 00:12:47,320
among other healthcare professionals

213
00:12:47,320 --> 00:12:52,400
and they are the ones responsible for
routine bedside monitoring of patients.

214
00:12:52,400 --> 00:12:56,000
So in a recent multi-site study,
we found that nurses

215
00:12:56,000 --> 00:13:00,040
have gaps in their knowledge
about sepsis and sepsis management.

216
00:13:00,040 --> 00:13:03,360
So the nurses did recognize
that they have this knowledge gap,

217

00:13:03,640 --> 00:13:06,600
which in turn
led them to have this lack of confidence

218
00:13:06,600 --> 00:13:10,000
in identifying
and assessing patients for sepsis.

219
00:13:10,320 --> 00:13:13,040
So this knowledge gap actually
further reiterates

220
00:13:13,040 --> 00:13:17,040
the need to ensure that nurses
knowledge of sepsis is in keeping

221
00:13:17,040 --> 00:13:21,840
with the latest evidence based knowledge
and best practices, as well as the need

222
00:13:21,840 --> 00:13:26,640
to improve their confidence in recognizing
and managing patients with sepsis.

223
00:13:27,800 --> 00:13:31,240
In addition, nurses in our study
expressed their desire

224
00:13:31,240 --> 00:13:34,680
for more sepsis education
and training opportunities,

225
00:13:34,920 --> 00:13:39,360
and an implementation of sepsis screening
tool and sepsis care protocol.

226
00:13:39,640 --> 00:13:44,400
So in fact, research has shown

that sepsis education and protocol

227
00:13:44,400 --> 00:13:47,760
based sepsis care comes as a bundle,

228
00:13:47,760 --> 00:13:52,680
and can act in synergy to improve care
processes and patient benefits.

229
00:13:52,680 --> 00:13:57,040
So at present, I'm working with this group
of clinicians to develop a

230
00:13:57,040 --> 00:14:00,400
a blended simulation-based training
program for hospital nurses.

231
00:14:00,720 --> 00:14:05,080
So this program is actually our first step
and major component to our Sepsis

232
00:14:05,520 --> 00:14:09,080
Performance Improvement Initiative,
which aims to improve

233
00:14:09,120 --> 00:14:12,400
adherence to the guidelines of protocol
for Sepsis care.

234
00:14:12,840 --> 00:14:14,760
This sounds so interesting and exciting.

235
00:14:14,760 --> 00:14:17,160
We wish you all the best in this research
project.

236
00:14:17,160 --> 00:14:19,680

Thank you. Yeah.
So in a nutshell.

237
00:14:19,960 --> 00:14:23,600
I personally feel that technology can be a powerful tool

238
00:14:23,600 --> 00:14:25,720
for facilitating the learning process.

239
00:14:26,000 --> 00:14:29,920
So active learning can be enhanced
with educational technology

240
00:14:29,920 --> 00:14:33,480
applications in a well-designed
and structure format.

241
00:14:33,920 --> 00:14:37,880
Nonetheless, the use and integration
of technology should be directed

242
00:14:38,040 --> 00:14:41,600
by the educational needs
to optimize the learning outcomes.

243
00:14:41,880 --> 00:14:42,160
Right.

244
00:14:42,160 --> 00:14:43,160
Thank you very much, Dr. Chua

245
00:14:43,160 --> 00:14:44,040
for sharing with us

246
00:14:44,040 --> 00:14:46,920
your wonderful insights on this area
and for joining us today.

247
00:14:47,160 --> 00:14:50,920
Yeah, thanks for having me as well
and to share this platform.

248
00:14:51,680 --> 00:14:55,800
So you've been listening to a podcast
on recognizing and managing sepsis

249
00:14:56,040 --> 00:15:00,240
through virtual reality
and enhanced active learning strategies,

250
00:15:00,520 --> 00:15:03,880
part of the NUS Nursing Research Podcast series.

251
00:15:03,880 --> 00:15:06,200
With us in the studio was Dr Chua Wei Ling,

252
00:15:06,200 --> 00:15:12,480
a Research Fellow at the Alice Lee Centre for Nursing Studies, National University of Singapore.

253
00:15:12,480 --> 00:15:14,240
I'm Dr. Jocelyn Chew.

254
00:15:14,240 --> 00:15:16,080
Thank you. And till the next time.