—Short Communication—

Expectations for the Next Generation of Simulated Patients Born from Thoughtful Anticipation of Artificial Intelligence-Equipped Robot

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It is predicted that in the near future robot simulated patients (SPs) will come into use. Through the impressions of five SPs about robot SPs, we explored their vision of the future of medical education as an indicator of what ordinary citizens think. The opinions of SPs were collected using a semi-structured focus group interview, after which the perspectives provided were explored using a qualitative research method called Steps for Coding and Theorization (SCAT). Although SPs accepted the introduction of robot SPs, they regard them as potential substitutes. The use of robot SPs raised concerns about the level of response to human diversity and the level of emotional intelligence. The problem of how much diversity among patients and doctors is acceptable in the field of education was identified. On the part of citizens, there is not much expectation that artificial intelligence (AI) will lead to sophisticated machines capable of human conversation. However, looking ahead to the AI era, real SPs anticipate that, along with the evolution of AI, the next generation of SPs will have thought deeply about their role within a program employing both humans and robots. (J Nippon Med Sch 2018; 85: 347–349)

Key words: OSCE, medical interview, standardization, diversity, emotional intelligence

Purpose and Background

We are reconsidering the role of the simulated patient (SP) from various perspectives and are trying to nurture the next generation of SPs who will contribute to medical education. Upon reflecting on their activities, SPs said that if the university's need for SPs is eventually primarily as a partner for objective structured clinical examinations (OSCEs), carried to its logical conclusion, a robot is enough. Focusing on this feedback from SPs, we implemented a semi-structured focus group interview (FGI) to address the question of whether robots can take the place of SPs. In this research, we investigated how SPs imagine a near future in which robot SPs and real SPs coexist.

Method

The participants were five SPs (3 men, 2 women, mean age 64.8 ± 7.5) who had worked as SPs for an average of 9.8 ± 2.4 years. Inferring from past work experience and daily life, we excluded SPs with an apparent interest in AI from this study.

The first author performed the FGI in June 2017. Group discussions were recorded and then transcribed. The first author and a co-author analyzed the transcribed material using Steps for Coding and Theorization (SCAT), a method of qualitative data analysis[1]. Another co-author then joined for conceptualization. Language data, such as interview recordings, free descriptions, etc., are segmented and then analyzed in the next 4 steps: (1) extraction of phrases to be noted in the data; (2) translation to words other than data; (3) creation of concepts such as background, cause, and results that explain (2); and (4) description of the theme/composition concept based on the previously created concepts. Ultimately, a story line is created based on the theme/composition concept. We interviewed SPs, focusing on the difference in usefulness between robot SPs and real SPs in the context of an OSCE setting, medical communication education, and predicted future education. The protocol was approved by the ethics committee at our institute (#27-05).

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Table 1 The *main category*, "sub category", and the number of descriptions are shown

Main category/"Sub category"	Number of descriptions
1. *Robot's identity*	
"The trend of the times"	5
"Substitute with potential contempt"	15
2. *Recognition of the limits of robots*	
"Diversity"	4
"An expectation of emotional intelligence (EI)"	12
3. *Dilemma in current education*	
"Skeptical about standardization"	11
"Redefinition of medical communication education outcomes"	9
"Sequence of communication education"	10
4. *Next generation of SPs to meet expectations*	
"Future prediction process"	4
"Future mission to encourage acceptance of coexistence"	7

Results

A total of 92 descriptions were extracted. As a result of the step coding, four items were extracted as the *main category* in step 4, nine items were extracted as "sub categories" in step 3 and conceptualized. The *main category*, "sub category", and the number of descriptions are shown in **Table 1**. The story line formed from the concept is described below.

According to "the trend of the times," SPs assessed *robot's identity* from a current citizen's point of view. And while accepting a robot SP, they regard it as a "substitute and with potential contempt". *Recognition of the limits of robots* leads to concerns as to how much a robot SP can deal with human diversity. In addition, although SPs had "an expectation of emotional intelligence (EI)" in the robot, they were conscious of its limits. They were "skeptical about standardization" arising from the characteristics of robots, and worried about mass-production of standardized doctors. Because it is difficult to deal with the "diversity" of learners, educators, patients, and doctors, SPs thought it would become a *dilemma in current education*. From a series of "future prediction process", it was reaffirmed that one mission of SPs is to nurture empathy, which was not being sufficiently fulfilled, even now. They recognize that careful consideration of a "future mission to encourage acceptance of coexistence" with AI and robots is needed in order for the *next generation of SPs to meet expectations*.

Discussion

Recent technical innovation is becoming a threat in the medical field, including education[2,3]. In this study, SPs acknowledged the potential usefulness of robots with AI for medical interview practice and evaluation, accepting the *robot's identity* from the viewpoint of standardization. On the other hand, they also thought of robots as "substitute and with potential contempt". In survey results, citizens of the United States tended to see AI as being different from humans and a superior technology[4]. In Japan, by contrast, AI is seen as a technology to compensate for labor shortage[4]. The present survey shows that the viewpoints of SPs are consistent with the current situation in Japan. SPs are considered to contribute effectively to improving the EI of medical students[5]. In the present study, SPs showed *recognition of the limits of robots* in that robots will not understand human nature. They think of communication skills and the capacity for conversation as basic human characteristics that, even in the era of AI, will be beyond the capability of robots. Consequently, the contribution of AI in the area of communication education is not expected to be comparable to its contribution in other fields. The extent, to which SPs comprehend the current status of AI development, including emotion recognition and emotion generation engines, varies. Perhaps there also is a concern in the background as to "*whether or not singularity is near*," which is common among citizens in general[4].

Moreover, "skeptical about standardization" was found to be an issue in medical education. The SPs who participated in this study routinely participate as SPs in both standardized patient and educational activities as simulated patients at our university. At OSCEs, for example, SPs fully recognize that standardized acting and evaluation is necessary for the training course. On the other hand, they also recognize there is an inherent need for "diversity", as students must learn to effectively communicate with a diverse population, and reconciling the two roles of SPs highlights a *dilemma in current education*. We

usually teach that the phrases used in an OSCE should be learned, including forms of Japanese words and background culture. For example, a real SP will surely educate students on what corresponds to "*karate kata*". Like karate training, students should practice repeatedly using robots. SPs thought that it was necessary to consider the "sequence of communication education". SPs are interested in "redefinition of medical communication education outcomes". In addition, SPs are conscious of the diversity of student growth. They make educators aware of the need for a robust portfolio of capabilities.

The next generation of SPs, who provide perspective of general citizens, considers current education to be ahead of the times and makes recommendations to educators. At the same time, it was inferred that along with the evolution of AI, the SPs themselves recognize the need to think deeply about what will be expected of the next generation of SPs.

The results of this study were obtained from five SPs. Nevertheless, we suggest the results reveal many citizens' perceptions of the present Japanese situation in which AI and robots are attracting very much attention.

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Conflict of Interest: The authors declare that they have no conflict of interest.

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