Barriers, Challenges, and Supports to the Implementation of Standardized Patients and Simulated Environments by Occupational Therapy Education Programs

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Abstract

A national survey examined the implementation rates, barriers, challenges, and supports to implementation of two types of simulation (standardized patients and simulated environments) by entry-level occupational therapy education programs in the United States. It also sought to identify relationships between program characteristics and implementation of these types of simulation. An online survey inquiring about academic program characteristics and use of simulation was sent to all occupational therapy and occupational therapy assistant programs in the United States in 2017 prior to the implementation of the 2018 Accreditation Council for Occupational Therapy Education Standards and the onset of the COVID-19 Pandemic. Data were analyzed using both statistical and content analysis. There were 97 responses to the survey, with an approximate response rate of 23.8%. Thirty-eight percent of responses used standardized patients and 70% used simulated environments in their didactic coursework. Programs at private institutions were more likely to use standardized patients than programs at public institutions (Cramer's V=0.229; p=0.024). Funding was the most cited support, challenge, and barrier to the use of standardized patients. Physical space was the most cited support and challenge for the use of simulated environments, with funding as the most cited barrier. Study results indicate that adequate funding, space, and potentially other resources are needed for successful implementation of these types of simulation. Future research should further study the barriers and supports to implementation of simulation by occupational therapy academic programs as well as further examination of implementation rates.

Keywords

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Acknowledgements

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ABSTRACT

A national survey examined the implementation rates, barriers, challenges, and supports to implementation of two types of simulation (standardized patients and simulated environments) by entry-level occupational therapy education programs in the United States. It also sought to identify relationships between program characteristics and implementation of these types of simulation. An online survey inquiring about academic program characteristics and use of simulation was sent to all occupational therapy and occupational therapy assistant programs in the United States in 2017 prior to the implementation of the 2018 Accreditation Council for Occupational Therapy Education Standards and the onset of the COVID-19 Pandemic. Data were analyzed using both statistical and content analysis. There were 97 responses to the survey, with an approximate response rate of 23.8%. Thirty-eight percent of responses used standardized patients and 70% used simulated environments in their didactic coursework. Programs at private institutions were more likely to use standardized patients than programs at public institutions (Cramer's V=0.229; p=0.024). Funding was the most cited support, challenge, and barrier to the use of standardized patients. Physical space was the most cited support and challenge for the use of simulated environments, with funding as the most cited barrier. Study results indicate that adequate funding, space, and potentially other resources are needed for successful implementation of these types of simulation. Future research should further study the barriers and supports to implementation of simulation by occupational therapy academic programs as well as further examination of implementation rates.

Introduction

Simulation is defined as "a technique for practice and learning" that replaces and amplifies "real experiences with guided ones, often 'immersive' in nature, that evoke and replicate substantial aspects of the real world in an interactive fashion" (Gaba, 2004, p. 126). Simulation is a broad educational technique that encompasses a variety of learning approaches. Simulation may be incredibly lifelike or may be only a partial task in a classroom setting; it may include actors, mannequins, partial mannequins, or even virtual reality or web based. It may be completed in groups or individually, may be primarily observation, or even might include extensive hands-on experience (Bethea et al., 2014; Gaba, 2004; Matilla et al., 2020; McGaghie et al., 2020).

Simulation as an educational method has risen in use in both occupational therapy (OT) education (Bethea et al., 2014; Bennett et al., 2017) and other allied health professions education, including nursing (Cant & Cooper, 2016; Mulyadi et al., 2021; Shin et al., 2015), physical therapy (Mori et al., 2015; Pritchard et al., 2016), communication sciences and disorders (Dudding & Nottingham, 2018), and audiology (Dzulkarnain et al., 2015). There is also a rise in the use of simulation as interprofessional learning experiences (Marion-Martins & Pinho, 2020; Thomas et al., 2017; Nieuwoudt et al., 2021) and long-standing use within the medical field and physician training (Rosen, 2008). This ongoing use is unsurprising, given the positive outcomes shown for students in psycho-motor skills, self-efficacy, communication skills, and even performance during clinical placements (Cant & Cooper, 2016; Grant et al., 2021; Kaplonyi et al., 2017; Mori et al., 2015; Ozelie & Both, 2016; Shin et al., 2014; Thomas et al., 2017; Wu & Shea, 2009).

In OT education in the United States, a variety of types of simulation have been used across academic programs (Bethea et al., 2014; Mattila et al., 2020). In both the United States and internationally, research primarily points to its use as part of didactic coursework (Bethea et al., 2014; Grant et al., 2021). Entry-level OT education programs in the United States can utilize simulation as a method for fieldwork education for the first time following the implementation of the 2018 Accreditation Council for Occupational Therapy Education (ACOTE) standards. However, these standards allow only for the use of two specific types of simulation as Level I fieldwork education: standardized patients and simulated environments (ACOTE, 2018). The implementation of these standards was timely, as the onset of the COVID-19 pandemic caused many academic programs to increasingly turn to simulation to help meet clinical education needs as traditional fieldwork education settings had limited availability (Mattila et al., 2020).

While we assume simulation implementation rates have increased following the implementation of the 2018 ACOTE Education standards, little is known about the implementation rates of these types of simulation by academic programs prior to that point or prior to the onset of the COVID-19 pandemic. Previous research by Bethea et al. (2014) looked broadly at the implementation rates of simulation but included many different types of simulation without specificity of the types of simulation now allowed for fieldwork education in their analysis. No other research, to the authors' knowledge, has

examined the implementation rates, barriers, challenges, and supports to implementation in OT education. Therefore, this study sought to answer three main questions:

1) What are the implementation rates of simulated environments and standardized patients by OT education programs?
2) What are the relationships between program characteristics and implementation rates of these types of simulation?
3) What are the barriers, challenges, and supports to the use of these types of simulation?

Method

Design
This study utilized survey methodology and was granted Institutional Review Board exemption due to the nature of the study and the low risk posed to the study participants.

Instrument
The researchers developed a descriptive survey that included program characteristics, and both closed- and open-ended questions relating to the use of experiential learning methods as listed in the 2018 ACOTE standards. These questions inquired about supports, challenges, and barriers to implementation of these methods. They also solicited examples and further information about the use of experiential learning methods within the program. Examples of questions include:

- Does your program currently utilize standardized patients in your didactic curriculum or fieldwork experiences?
- (If yes) What challenges or barriers do you face in using standardized patients?
- (If no) Describe any barriers that prevent the use of standardized patients within your program.
- (If no) Do you plan to implement the use of standardized patients in your program within the next 1-2 years?

For each experiential learning method listed on the survey, the ACOTE (2018) definition of the term was provided (see Table 1). Survey development included utilizing expert review of questions, first revision of the survey to incorporate feedback, pilot testing of the survey, and final revision of the survey before distribution.

Table 1

Definition of Terms

Term	ACOTE Definition
Standardized Patients	An individual who has been trained to portray in a consistent, standardized manner, a patient/client with occupational needs
Simulated Environment	A setting that provides an experience similar to a real-world setting in order to allow clients to practice specific occupations (e.g., driving simulation center, bathroom or kitchen centers in a rehabilitation unit, work hardening units or centers)

Sampling and Data Collection
The survey was housed on a secure, web-based platform. The link to the survey was sent electronically via email to all program directors and fieldwork educators at ACOTE accredited and developing OT and OTA education programs directly by the American Occupational Therapy Association (AOTA) along with an introductory letter. The survey was distributed in the spring and summer of 2017.

In total, the survey had 97 unique responses; duplicate responses from the same person at two points in time, or two people from the same institution, were removed. Duplication of responses was determined by cross-checking voluntary contact information and IP addresses for all responses.

At the time of the initial survey, there were 407 accredited and candidate OT and OTA programs in the United States (ACOTE, 2017) resulting in an approximate response rate of 23.8%. A true response rate cannot be established due to some responses representing multiple programs within the same institution, but also because the survey was distributed directly to program personnel through the American Occupational Therapy Association. Access to the mailing list, as well as to undeliverable emails, was not provided.

Data Analysis
For this study, only survey data relating to the use of standardized patients and simulated environments was included. Survey data relating to the use of other experiential learning methods was not included in the analysis.

Analysis of survey data included descriptive analysis of program characteristics and cross-tabulation analysis (Pearson's chi-squared tests) of program characteristics and simulation methods utilized. All quantitative data analysis was performed using IBM SPSS version 24.0 (IBM Corp, Armonk, New York, USA).

Open-ended responses to survey questions were analyzed using conceptual content analysis without the use of computer programming. Categories were defined using a flexible addition process, in which categories were generated throughout the initial coding process. Two separate researchers completed the initial coding and generated preliminary categories. These preliminary categories were then compared, differences were noted and discussed, and categories were finalized through mutual agreement of researchers. All open-ended question responses were then coded a second time for existence of a category within each response.

Results

Program Characteristics

Program responses included representation from both OT and OTA programs, with all levels of OT education represented except for entry-level Bachelor OTA programs. There was a wide variety in the age of programs, as well as nearly even representation of private and public institutions (see Table 2).

Table 2

Program Characteristics

Program Characteristics		n (%)
Degree Level	Associate (OTA)	39 (40.21)
	Bachelor (OTA)	0 (0)
	Master's (OT)	36 (37.11)
	Doctoral (OT)	8 (8.25)
	Multiple Degrees	14 (14.43)
Age of Program	<5 Years	24 (24.74)
	5-9 Years	15 (15.46)
	10-15 Years	6 (6.19)
	>15 Years	52 (53.61)
Type of Institution	Private	49 (50.52)
	Public	48 (49.48)

Use of Simulation

Analysis of the implementation rates of simulation indicated the majority of academic programs did not currently use standardized patients, while the majority of programs did use simulated environments. Further detail on the use of both simulation methods` is detailed in Figures 1 and 2.

Figure 1

Current Use of Standardized Patients
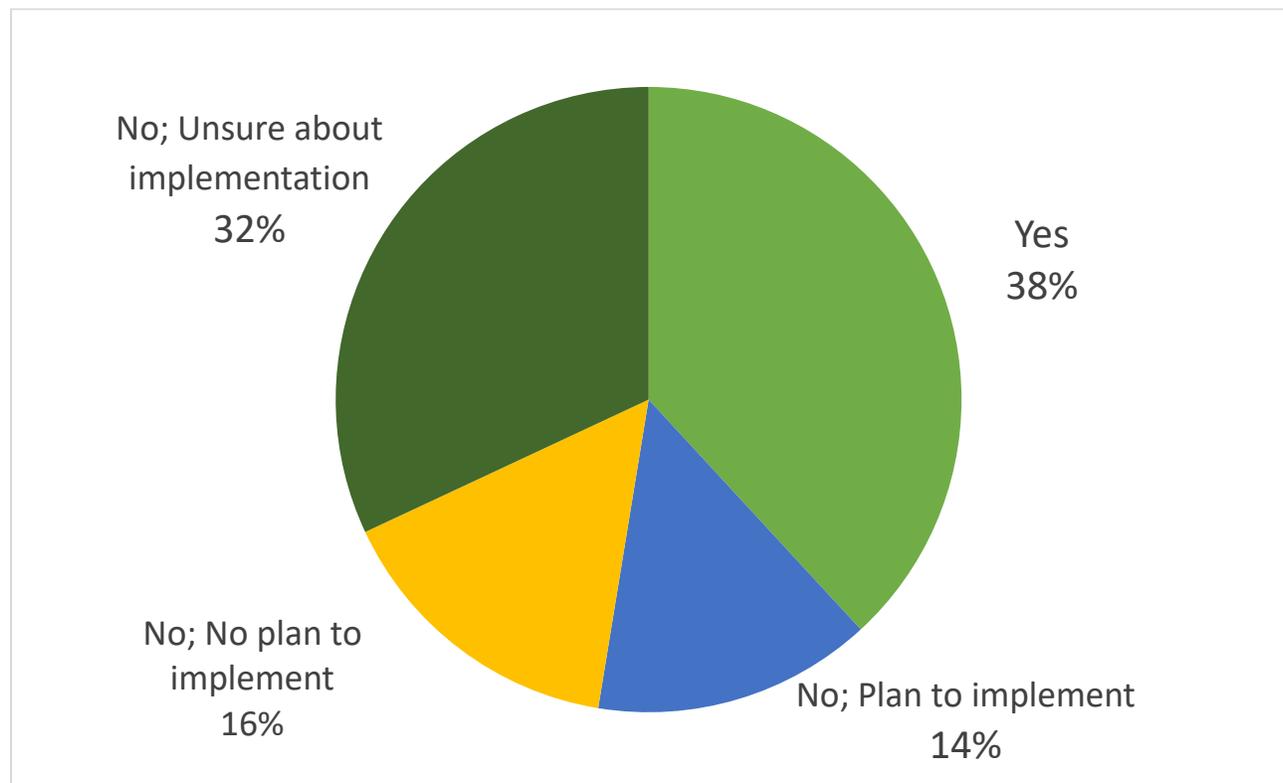
Program Characteristics and Use of Simulation

Cross-tabulation analysis was used to determine which factors resulted in a difference in the utilization of standardized patients and simulated environments. Results of the analysis revealed only one statistically significant correlation: Between the institution type (public or private) and the use of standardized patients (Cramer's V=0.229; p=0.024). No other statistically significant correlations were found between program characteristics and the use of standardized patients or simulated environments.

Figure 2

Current Use of Simulated Environments
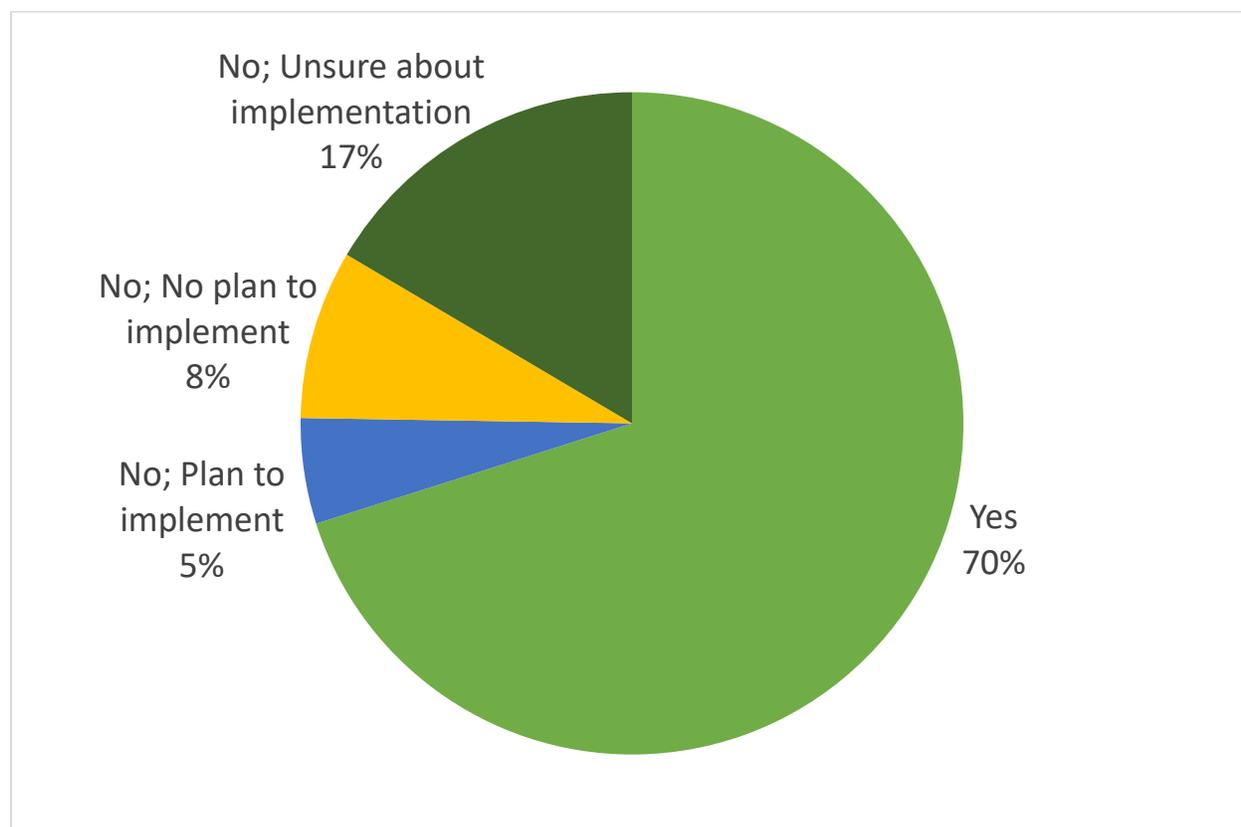
Content Analysis of Barriers and Supports to Implementation
There were commonly stated answers to the short-answer questions on the survey regarding the supports, challenges, and barriers to implementation of standardized patients and simulated environments (see Table 3).

For standardized patients, funding (or a lack thereof) was the primary support, challenge, and barrier identified. Access to volunteers or standardized patients themselves also was identified for all three categories. Other identified supports included physical space and qualified personnel; challenges included scheduling and time; barriers included training standardized patients and curriculum design.

For simulated environments, physical space was identified as the top support and challenge, though the second most common barrier to use. Funding also appeared in all three categories, as did equipment and technology. Supports for simulated environments also included funding, and challenges and barriers also included sufficient time.

Table 3

Top Four Most Stated Supports, Challenges, and Barriers to Implementation of Standardized Patients and Simulated Environments and Frequency of Answers

Standardized Patients (SPs)			Simulated Environments		
Supports (n)	**Challenges (n)**	**Barriers (n)**	**Supports (n)**	**Challenges (n)**	**Barriers (n)**
Funding (10)	Funding (11)	Funding (31)	Physical Space (42)	Physical Space (22)	Funding (7)
Physical Space (9)	Scheduling (10)	Access to Volunteers or SPs (17)	Equipment and Technology (14)	Equipment and Technology (13)	Physical Space (4)
Access to Volunteers or SPs (9)	Time (8)	Training SPs (12)	Funding (11)	Time (10)	Time (2)
Qualified Personnel (8)	Access to Volunteers or SPs (6)	Curriculum Design (7)	Personnel (6)	Funding (6)	Equipment (1)

Discussion

It is important to note the discrepancy between implementation rates for standardized patients versus simulated environments. Simulated environments have a much higher implementation rate by academic programs versus standardized patients. This could perhaps be due to the integration of simulated environments into the didactic curricula by academic programs as a more standard practice in OT education. However, standardized patients may have broader appeal for use in a fieldwork environment, as shown by 46% of programs stating they "plan to implement" or are "unsure about implementation" of this educational technique. In contrast, because simulated environments are already embedded in didactic coursework (70% of programs reporting use), the widespread acceptance of this educational technique as a fieldwork experience may be more limited.

One could hypothesize that newer programs (who have recently developed their curriculum) may be more likely to implement simulation; one could also hypothesize that smaller programs would have an easier time implementing simulation; or even that larger programs may need to utilize simulation more broadly to meet program goals due to limitations with support from outside clinical and educational partners. This line of thinking was not supported by the results of this survey. Surprisingly, there was only one statistically significant correlation found between program characteristics and the use of standardized patients and simulated environments. Program size, degree type

and level, and even age of program did not yield any statistically significant correlations with the use of either simulation method. The only significant correlation that was identified was program type, with private institutions being more likely to utilize standardized patients than public institutions. The reasons behind this are unknown, and further research is needed.

The most cited supports, challenges, and barriers to the use of standardized patients and simulated environments all relate to a broader idea of funding and/or institutional support. It is evident that programs that have institutional support, including institutional funding, likely have the needed space, qualified personnel, and equipment and technology, and other requirements for the implementation of these types of simulation. Conversely, those programs that do not have the required institutional support find these very same factors to be barriers to implementation. This finding echoes the findings of literature in both OT and other disciplines who determined that time and cost were among the challenges to the implementation of simulation (Bethea et al., 2014; Rhodes & Curran, 2005; Tackman & Shelley, 2010). For there to be widespread use of simulation by OT academic programs, these barriers must be addressed through additional institutional support and/or through creative problem-solving. For example, the use of virtual simulation is a resource-effective way to provide simulation experiences to students of all levels, though this requires institutional support for access to appropriate technology and training. Some additional examples include using alumni as volunteer standardized patients, using pre-created simulation scenarios, utilizing video-simulation software, and having students complete simulation activities in groups versus individually to reduce the number of needed standardized patients.

Interestingly, programs listed access to standardized patients and volunteers as a major support, challenge, and barrier. This may be due to funding or due to difficulty recruiting and training the standardized patients (though these were coded separately, as indicated in responses). However, it seems that particularly for programs that are in more rural areas, having access to standardized patients at all, even with adequate funding and institutional support, may be a significant issue to implementation of this model of instruction. Again, creative solutions should likely be explored. For example, the use of standardized patients through telehealth eliminates many of the barriers of location and may be a feasible option for some simulation activities.

Limitations

The true response rate from programs is unknown and the approximate response rate represents only about 24% of OT education programs. However, it is incredibly unlikely that the response rate was lower than reported; in fact, it is very likely that the true response rate was higher as some emails may not have reached the intended recipients, and, in some cases, multiple programs were represented by a single response from one institution.

It is possible that the programs that responded felt strongly about the use of simulation. Strong positive or negative feelings may create a response bias. Therefore, the results of this study may not be generalizable to all academic programs.

Another limitation is potential skewing of results due to misunderstanding of the definitions of the terms "standardized patients" and "simulated environments." A small number of participants clearly misunderstood the experiential learning methods described. For example, one program stated they bring in local pediatric clients for a handwriting clinic as an example of how they incorporate standardized patients into their curriculum. This activity, while providing hands-on experiential learning for students, does not meet the ACOTE definition of a standardized patient. Due to this type of misunderstanding, it is likely that a small number of respondents were not able to provide accurate information on their survey responses. However, the majority of participants did describe the appropriate experiential learning activities, when provided, for the type of simulation.

Further Research and Implications for OT Education
The results of this study guide future research, emphasize the importance of resource development and dissemination, and provide guidance for academic institutions in implementation of simulation within OT education programs.

First, this study highlights the need for additional research in the use of simulation in OT education. Particularly, given that many programs state that funding is both a barrier and a challenge to the implementation of standardized patients and simulated environments, research into feasibility and outcomes of lower-cost methods of simulation is needed.

Second, the outcomes of the study indicate that OT education programs would benefit from widely available, easy to access, and low-cost or free resources to help with the development and implementation of simulation within their own curriculums. These resources may include trainings, online programs, or widely available books and curriculum guides. Access to these resources may allow academic programs to overcome some of the institutional barriers to implementation of simulation, including the challenges and barriers of time and funding.

Finally, academic institutions should consider the supports, challenges, and barriers to implementation of these types of simulation by occupational therapy education programs. Simulation offers an innovative way for OT education programs to meet fieldwork needs as well as increase access to client interactions without overburdening outside fieldwork sites and partners, which is especially important in the times of the COVID-19 pandemic. However, the feasibility of the implementation of simulation, as shown in the study results, is often hindered by the limited resources (including funding and space) provided by academic institutions. For simulation to become more widely implemented and to truly reduce the burden of fieldwork education on fieldwork sites and partners, academic institutions may need to provide resources to help occupational therapy education programs overcome the common barriers and challenges and strengthen existing supports.

Conclusion

At this time of the study, a minority of OT education programs who participated in this study used standardized patients while the majority of programs who participated used simulated environments in their didactic curriculums. Participating OT education programs reported a need for institutional support in the provision of adequate funding, space, and other resources to allow for implementation of simulation within their programs. Future research should continue to look at the barriers and supports to implementation, as well as encourage the development of resources and institutional support to aid programs in implementation of simulation to meet curricular and fieldwork needs.

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