The Open Journal of Occupational Therapy

Volume 4
Issue 4 *Fall 2016*

Article 9

October 2016

High-Fidelity Simulation in Occupational Therapy Curriculum: Impact on Level II Fieldwork Performance

Rebecca Ozelie
Rush University - USA, rebecca_ozelie@rush.edu

Catherine Both
Rush University - USA, Catherine_M_Both@rush.edu

Emma Fricke
Rush University - USA, Emma_C_Fricke@rush.edu

Carolyn Maddock
Rush University - USA, Carolyn_Maddock@rush.edu

Recommended Citation

Ozelie, R., Both, C., Fricke, E., & Maddock, C. (2016). High-Fidelity Simulation in Occupational Therapy Curriculum: Impact on Level II Fieldwork Performance. *The Open Journal of Occupational Therapy, 4*(4). https://doi.org/10.15453/2168-6408.1242

High-Fidelity Simulation in Occupational Therapy Curriculum: Impact on Level II Fieldwork Performance

Abstract

Simulation experiences provide experiential learning opportunities during artificially produced real-life medical situations in a safe environment. Evidence supports using simulation in health care education yet limited quantitative evidence exists in occupational therapy. This study aimed to evaluate the differences in scores on the AOTA *Fieldwork Performance Evaluation for the Occupational Therapy Student* of Level II occupational therapy students who received high-fidelity simulation training and students who did not. A retrospective analysis of 180 students from a private university was used. Independent samples nonparametric *t* tests examined mean differences between Fieldwork Performance Evaluation scores of those who did and did not receive simulation experiences in the curriculum. Mean ranks were also analyzed for subsection scores and practice settings. Results of this study found no significant difference in overall Fieldwork Performance Evaluation scores between the two groups. The students who completed simulation and had fieldwork in inpatient rehabilitation had the greatest increase in mean rank scores and increases in several subsections. The outcome measure used in this study was found to have limited discriminatory capability and may have affected the results; however, this study finds that using simulation may be a beneficial supplement to didactic coursework in occupational therapy curriculums.

Keywords

Simulation, Fieldwork, Education

Cover Page Footnote

We would like to thank Rush University for support of this project. We would like to thank Dr. Patricia Murphy for her statistical expertise and Dr. Mary Ellen Stoykov for her guidance and feedback.

Credentials Display

Rebecca Ozelie, DHS, OTR/L, BCPR; Catherine Both, OTS; Emma Fricke, OTS; Carolyn Maddock, OTS

DOI: 10.15453/2168-6408.1242

Medical simulation embedded in health care education has become increasingly common (Bethea, Castillo, & Harvison, 2014). Medical simulation provides students with realistic professional situations in a carefully controlled environment (Bethea et al., 2014). The students gain exposure to potential scenarios and are able to reflect with evaluators after engaging in the experience (Saaranen, Vaajoki, Kellomaki, & Hyvarinen, 2015). Each simulation's level of fidelity—described as faithfulness to duplication of the real situation—varies based on constraints, such as cost, technology, and time (Lewiss et al., 2014). Although the use of simulation is widely accepted and has shown to be an effective form of health care education, implications for simulation in occupational therapy (OT) must be further explored (Cook et al., 2011).

High-Fidelity Simulation (HFS), or the artificial design of real-life situations using sophisticated technological mannequins, has gained prevalence in the educational training of health care professionals. HFS adds to traditional didactic and clinical programming by offering students a realistic environment in which to practice clinical situations without real-life consequences. HFS commonly uses a mannequin model known as the Human Patient Simulator, which is "capable of providing real-time physiological and pharmacological responses to various health conditions" (Bethea et al., 2014, p. S33) to emulate human anatomy and behavior. Another type of HFS, the standardized patient encounter, uses live actors to simulate patient roles and allows students to apply treatment knowledge in a safe, structured, complex environment followed by a guided debrief (Herge et al., 2013). According to Herge et al. (2013), students reported that the standardized patient encounter with a debrief enhanced their confidence and self-efficacy in clinical skill performance. Low-Fidelity Simulation (LFS), in contrast, is more cost-effective but consists of static equipment or mannequins versus the dynamic capabilities of HFS (Lewiss et al., 2014). LFS may include case studies or role-playing with standard mannequins. Patient educators, or people with specific pathologies trained to instruct students on patient evaluation, are a type of LFS used in occupational therapy student training (Hedge, Neville, & Pickens, 2015). According to Hedge, Neville, and Pickens (2015), students reported increased self-awareness, confidence, and empathy following hands-on opportunities with patient educators, which was believed to positively impact fieldwork (FW) performance yet focused on practice versus skilled assessment administration. HFS allows students experiential learning opportunities to integrate theoretical observation into practice, and outcomes have shown increases in students' communication skills, vital signs skills, decision-making skills, and crisis intervention skills (Richardson & Claman, 2014).

Cook et al. (2011) conducted a systematic review of 609 studies that investigated student outcomes after technology-enhanced simulation in comparison to the outcomes of students who did not receive the training. Simulation was associated with statistically significant, positive outcomes in comparison to the control group, with just a small percentage of outcomes showing no benefit (Cook et al., 2011). Through this review, Cook et al. demonstrated the use of simulation in medical, nursing, and other allied health programs. The simulation experiences reviewed by Cook et al. were focused primarily on clinical preparedness. Simulation training involving OT students, however, has typically focused on increasing interprofessional cooperation and understanding (Kraft, Wise, Jacques, & Burik, 2013; Shoemaker, Platko, Cleghorn, & Booth, 2014).

In an effort to examine the current benefits and challenges of simulation use specific to OT programs, Bethea, Castillo, and Harvison (2014) distributed a self-report, 23-question survey to 310 OT Assistant and OT entry-level programs. Seventy-one percent of these programs indicated simulation use. The top three goals for use indicated by entry-level master degree OT programs are increased clinical reasoning (92%), problem solving or decision-making abilities (88%), and communication skills (65%). The results of this study, as with the majority of OT-based studies, were qualitative self-reflections on the use, quality, and benefits of simulation (Bethea et al., 2014; Bradley, Whittington, & Mottram, 2013; Castillo, 2011; Giles, Carson, Breland, Coker-Bolt, & Bowman, 2014; Herge et al., 2013; Hedge et al., 2015; Shoemaker et al., 2011). Tomlin's (2005) study, *The Use of Interactive Video Client Simulation Scores to Predict Clinical Performance of Occupational Therapy Students*, is one of the only quantitative studies that examined the relationship between simulation training and student clinical performance in OT.

In this study, Tomlin (2005) looked at 2 successive years of students (Cohort 1 and Cohort 2) from one OT educational program. All 73 students participated in LFS that included observation of video footage of a rehabilitation client postcerebrovascular accident and then the answering of questions about their observations and interpretations of the incident. Tomlin employed a multiple regression model using coursework grades and simulation scores to predict performance in subsequent physical disability FW. The simulation scores component considered: Completeness (number of options selected per number of correct options), accuracy (number of correct options selected per total number of options), and time efficiency (number of correct scores divided by time elapsed). Tomlin found that in Cohort 1, the first class of students studied, the completeness component of simulation scores and didactic grades together significantly predicted Fieldwork Evaluation (FWE) scores (adj. $R^2 = .434$, $F[2, 39] = 16.75$, $p < .0001$). For Cohort 2, time efficiency scores significantly predicted FWE scores (adj. $R^2 = .453$, $F[4,21] = 6.17$, $p < .002$). Although significant predictors for each cohort varied, Tomlin (2005) showed that some aspect of simulation training scores is responsible for the variability in FWE scores.

LFS, however, lacks the kinesthetic, active participation piece of learning that HFS allows. While Tomlin's study examined the effectiveness of LFS and FWE scores, reviewing the wide variety of simulation techniques used in OT programs, such as HFS, will facilitate development of best-practice scenarios (Bethea et al., 2014). Increased

https://scholarworks.wmich.edu/ojot/vol4/iss4/9
DOI: 10.15453/2168-6408.1242

justification is necessary for programs to accommodate the challenges associated with HFS, including time, expense, and scheduling (Bethea et al., 2014). Therefore, Bethea et al. (2014) have called for more research regarding simulation's effects on program and student learning outcomes.

A common measurement of OT student learning outcomes is FW experiences. The American Occupational Therapy Association (AOTA) explains, "the purpose of fieldwork education is to propel each generation of occupational therapy practitioners from the role of student to that of practitioner" (2009, p. 821). Two levels of FW experiences present increasing demands to the student. Level I FW is designed to enrich the didactic coursework and allow the student to experience directed observation of and participation opportunities in the OT process. Level II FW occurs near the end of didactic learning and requires the student to independently provide OT services to clients, apply theory and knowledge gained in the classroom, conduct practice using occupation-based, evidence-based practice, and manage the communication and professionalism skills involved. The ultimate goal of the Level II FW experience is to develop entry-level practitioners (AOTA, 2009).

To assess student performance during these Level II FW experiences, many OT programs use the AOTA's *Fieldwork Performance Evaluation For The Occupational Therapy Student* (FWPE/OTS). The FWPE/OTS measures clinical skills and professional behaviors as evaluated by the FW educator upon completion of the experience. The purpose of the FWPE/OTS is to "provide the student with an accurate assessment of his/her competence for entry-level practice" (AOTA, 2002, p. 2). Level II FW is the culmination of the student's preceding academic and practical aspects of curriculum and is an integral aspect of OT programming. It allows the student to use knowledge in an increasingly independent environment while still being supervised (AOTA, 2009). Because HFS training allows students to demonstrate clinical skills prior to Level II FW, it is important to understand the relationship between HFS training and clinical performance outcomes.

The aim of this study was to evaluate if OT students who received HFS training scored higher during Level II FW placements than students who did not receive this training. Although simulation has been shown to be beneficial in other medical professions, it has not been thoroughly studied in OT. We hypothesized that students who received HFS training prior to beginning their Level II FW experiences would have higher FWPE/OTS scores than students who did not receive HFS training.

Method

Research Design

This study was a retrospective design. The Institutional Review Board of the University where the study was conducted granted approval to conduct this analysis and a waiver of consent due to the retrospective data collection procedures.

Participants

The participants were a convenience sample of 180 students from an accredited master of science in OT program. The OT program is part of a private, urban university housed in a medical center. Of the 180 participants, 87 completed Level

II FW from 2009 to 2011 (historical control group) and did not engage in a simulation experience, as it was not a part of the standard curriculum at that time. Because of the retrospective nature of this study, these participants were observed at a time in the past and are labeled as historical controls. The remaining 93 participants (simulation group) completed Level II FW from 2012 to 2014 and did engage in HFS. Inclusion criteria for this study was occupational therapy students who completed all required didactic coursework and received final scores for both Level II FW experiences. Each student's individual FW experiences were counted as separate encounters. If a student from either group did not receive a final score for either FW experience, the encounter was excluded to avoid an incomplete data set. Any make up FW scores were included. In addition, any students from 2012 to 2014 who did not complete simulation training were excluded. The initial sample for the simulation group was 189 FW encounters. This included three encounters of students that repeated FW due to a prior failure. Four FW encounters were excluded because the students did not receive a FWPE/OTS score. The final sample analyzed was 185. The initial sample for the historical control group was 174 FW encounters. Two encounters were excluded because the students did not receive a FWPE/OTS score. The final sample analyzed was 172. The FWPE/OTS scores were collected and recorded as routine departmental records prior to the initiation of this study.

Measures

Fieldwork performance evaluation. The students were assessed using the FWPE/OTS. Following the FW experience, the FW educators scored the students based on their performance. Available scores were: 1-*unsatisfactory*, 2-*needs improvement*, 3-*meets standards*, and 4-*exceeds standards*. Passing was defined by a final score of 121. The students were assessed in seven different performance areas (see Table 1). The FW educators completed the evaluation. Each FW educator had the opportunity to add additional comments on strengths and areas that need improvement, but only quantitative components were considered for this study.

A Rasch Model analysis evaluated the psychometric properties of the FWPE/OTS. The researchers analyzed a sample of 332 FWPE/OTSs (1,340 distributed with a return rate of 25%) from students practicing in a variety of settings. Based on the findings, the researchers concluded that an adequate number of variables assessed FW competency and that each item's standard error was acceptable. Because 41 of the 42 items on this assessment demonstrated goodness of fit with adequate item separation, few changes were made to the assessment. Final language changes and modifications to the rating scale were completed (Alter, 2003). No studies were found that examined the validity and reliability of the resulting amended FWPE/OTS.

https://scholarworks.wmich.edu/ojot/vol4/iss4/9
DOI: 10.15453/2168-6408.1242

Table 1

Subsections of the FWPE/OTS

#	Subsection Name	Description
1	Fundamentals of Practice	Adheres to the AOTA code of ethics and facility safety regulations.
2	Basic Tenets	Articulates the value of OT and the main values and beliefs of OT while working collaboratively with clients, families, and significant others.
3	Evaluation and Screening	Articulates clear and logical reasoning in evaluating client, chooses appropriate assessments, obtains client's profile, administers assessments, and adjusts evaluation as needed.
4	Intervention	Creates an evidence-based, client-centered intervention that is occupation-based and modifies intervention as necessary.
5	Management of Occupational Therapy Services	Can assign appropriate responsibilities to and collaborate with OTAs, understands site-specific costs and funding; remains organized and maintains appropriate productivity level.
6	Communication	Clear and effective verbal and nonverbal communication; correctly documents; has legible handwriting; speaks appropriately to recipient's understanding.
7	Professional Behaviors	Collaborates with supervisor; takes responsibility for professional growth; responds positively to feedback; demonstrates consistent work behaviors, time management skills, positive interpersonal skills, and respect for diversity.

Note. Reproduced from the *Fieldwork Performance Evaluation for the Occupational Therapy Student*. (AOTA, 2002).

Procedure

Prior to the initiation of this study, the simulation group took part in a HFS experience that was designed as part of a standard course in the OT program's curriculum. The HFS was conducted in the last full didactic quarter of the curriculum before the students began their Level II FW. The HFS was preceded by didactic coursework, which included three didactic lectures on occupational therapy in acute medicine, commonly used equipment in acute medicine settings, and current evidence related to acute medicine settings. One week prior to the HFS experience, the students were given three patients' histories and physical reports, short- and long-term OT goals, and treatment plans. The students were instructed to complete chart reviews and prepare to implement the treatment plan for the assigned patients. On the day of the HFS lab, groups of two to four students treated three consecutive patients in a mock intensive care acute medicine setting. The patients were HFS mannequins, specifically, iStan. iStan is a wireless patient simulator with internal robotics that mimic human cardiovascular, respiratory, and neurological systems. iStan can bleed and experience blood pressure, heart rate, and other clinical signs, and has fully articulating limbs for mobility purposes. This instructor can control the patient simulator from a remote laptop.

The students treated three patients that presented with neurological, orthopedic, and cardiovascular conditions, respectively. The student groups had 15 min to complete treatment with each patient. Faculty initiated critical events to which the students were advised to respond appropriately. The critical events included a patient going into cardiac arrest, having shortness of breath, complaining of dizziness or lightheadedness, or verbalizing substantial pain. On completion of the three sessions, the students documented daily treatment notes for each patient and completed a debriefing session with faculty. The students were scored on their professionalism in introducing themselves to the patient, their ability to skillfully conduct the planned therapy session in relation to the short-term goal and treatment plan, adherence to relevant precautions, clinical reasoning to evaluate the situation and explain observations, and overall communication and professionalism.

The historical control group did not receive the HFS experience, as it was not a part of the simulation experience, but the group did receive education and training on all clinical skills used in the HFS experience. They did not receive specific didactic lectures on OT in acute medicine, commonly used equipment in acute medicine settings, and current evidence related to acute medicine settings as the simulation group did.

The student FWPE/OTS scores were collected and recorded as routine departmental records prior to the initiation of this study. The scores of six students that did not meet the inclusion criteria were removed. The principal investigator de-identified the data prior to analysis in order to protect the subjects' identities.

Data Analysis

Using IBM SPSS Statistics Version 18.0 to calculate independent samples nonparametric *t* tests (Mann-Whitney *U*), we examined mean differences between the FWPE/OTS scores of the historical control group and the simulation group. Additional Mann-Whitney *U* tests investigated if a stronger relationship exists between simulation training and the subsections of the FWPE/OTS. A Mann-Whitney *U* test was also performed to determine the difference in mean rank between the FWPE/OTS acute medicine and inpatient rehabilitation scores of each group. After separating the data into the FW settings of pediatrics, mental health, outpatient, inpatient rehabilitation, acute care, and subacute, we analyzed all of the settings to find the greatest increase in mean scores.

In order to isolate the two extreme ends of the sample, the FWPE/OTS total and subtest scores from the individual classes of 2009 and 2014 were compared using the Mann-Whitney *U*. Mean rank, as opposed to mean score, is reported because the data is skewed and was analyzed using a nonparametric test. Mean rank is computed by ranking scores and denoting each score a value according to its placement (Field, 2009). Because of how ranks are assigned, the group with the lowest mean rank will have the lowest number of scores.

Results

The descriptive analysis of the FWPE/OTS scores by FW setting is shown in Table 2. When comparing the scores of the historical control group and the simulation group, no significant differences between overall FWPE/OTS mean rank scores were found ($p = 0.989$). Differences in mean rank, however, were found when discriminating between subsections of the FWPE/OTS. The simulation group showed increases in mean rank in subsections of evaluation and screening, communication, and professional behaviors but not with statistical significance (see Table 3).

DOI: 10.15453/2168-6408.1242

Table 2

Descriptive Statistics of FWPE/OTS Scores in Each FW Setting

	Historical Control Group			Simulation Group		
	N	Mean	*SD*	N	Mean	*SD*
Total	172	136.802	12.55524	185	135.5297	14.5375
Acute Care	42	135.7381	12.33488	35	133.6571	12.48279
Outpatient	18	138.1667	13.52666	34	139.5588	12.65196
Inpatient	37	131.5946	7.12375	42	130.833	21.17168
Subacute/SNF	7	141.5714	10.86059	11	135.1818	9.43205
Mental Health	17	139.0588	13.38596	10	137.6	12.55388
Pediatrics	51	139.1569	14.55661	53	137.5849	10.51635

Table 3

Mean Rank Differences of Each FWPE/OTS Subsection Between Groups

Subsection	Historical Control Group	Simulation Group	Mean Rank Difference	p-value
Fundamentals of Practice	179.92	178.15	-1.77	0.859
Basic Tenets	180.71	177.41	-3.30	0.733
Evaluation & Screening	177.04	180.82	3.78	0.717
Intervention	181.50	176.67	-4.83	0.653
Management of OT Services	186.33	172.18	-14.15	0.167
Communication	174.77	182.93	8.16	0.439
Professional Behaviors	178.31	179.65	1.34	0.902

Specific FW settings were analyzed to determine if the impact of HFS varied between settings. The results of these tests showed the greatest increase in mean rank was in the inpatient rehabilitation setting, with a FWPE/OTS increase of 3.35 (historical control group = 38.22, simulation group = 41.57, p = 0.516). Further investigation into the inpatient rehabilitation setting found increases in mean rank for the simulation group in the following subsections of the FWPE/OTS as well: basic tenets, evaluation and screening, intervention, communication, and professional behaviors (see Figure 1).

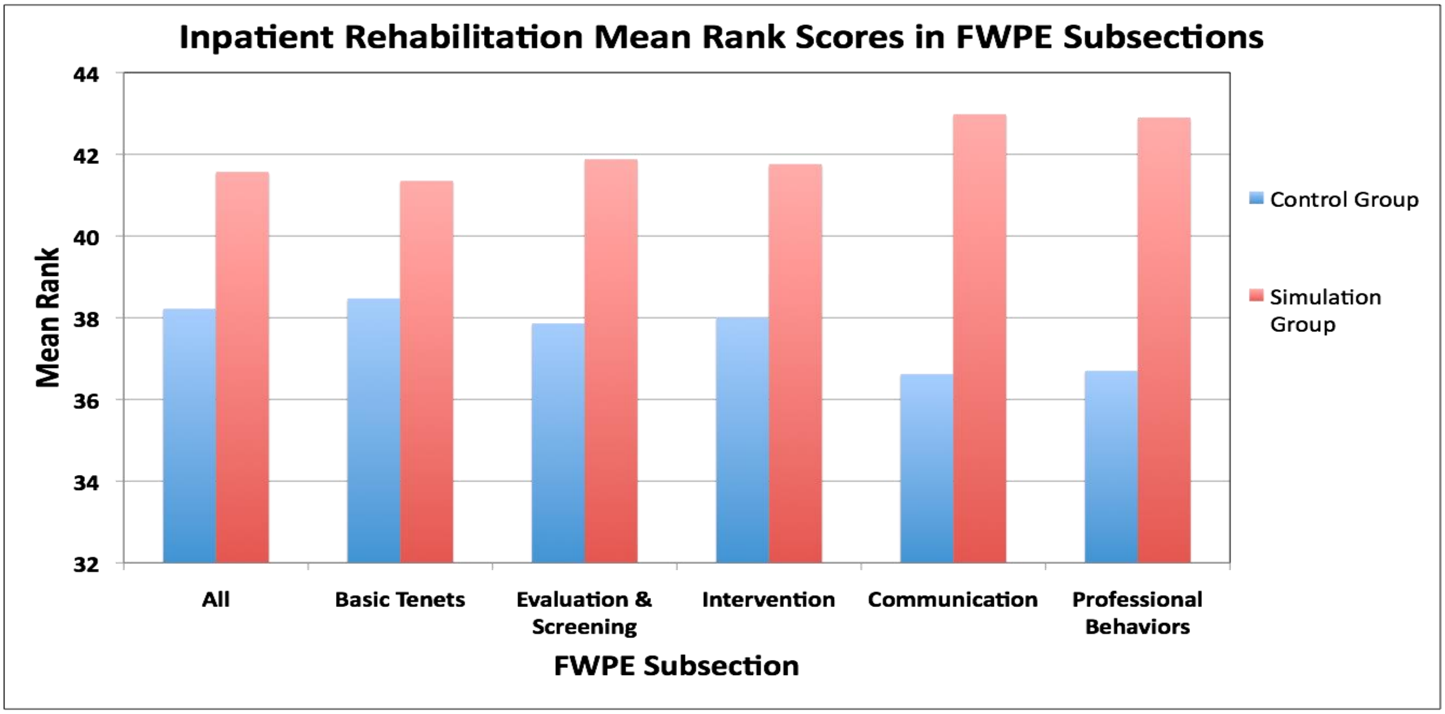

Figure 1. Mean rank score increases in the inpatient rehabilitation setting.

Discussion

The results of the initial nonparametric test found no significant difference in overall clinical preparedness (i.e., FWPE/OTS) scores between students who did not receive HFS training and those who did. This finding is contradictory to the current research of Cook et al. (2011) that found in a meta-analysis of 609 studies that simulation training is "consistently associated with large effects for outcomes of knowledge, skills, and behaviors" (p. 978). It is theorized that no significant difference was found in this analysis because the low variability and high means of FWPE/OTS scores. This makes it difficult to detect true differences in student performances based on the outcome measure used. Considering these findings and that the "reliability of [the FWPE] has not been established," this may account for the contradiction between this data and current research (Obrien & McNeil, 2013, p. 3).

Despite the limited variability of the outcome measure, this study did show improved, but not significant, mean rank scores in various subsections of the FWPE/OTS. The findings showed the simulation group mean rank increased in subsections of evaluation and screening, communication, and professional behaviors. These findings suggest that the collaborative nature of the institution's specific simulation experience, which occurs in groups of two to four students, may subsequently manifest in the student's ability to assess and screen patients, use communication skills, and use appropriate professional skills during FW. This is supported by the study of Fejzic and Barker (2015), who found that pharmacy students' professionalism significantly increased after they engaged in a simulation experience. Through HFS, students have an opportunity to practice and develop these skills through experiential learning. Experiential learning "requires the student to perform an activity or task, share the results and observations, discuss and then reflect on the process, connecting it with real world examples and applying it to another situation" (Sand, Elison-Bowers, Wing, & Kendrick, 2014, p. 2). It provides an opportunity for students to engage actively in an experience, practice skills applicable to their profession, and expand on concepts they have learned traditionally. Beyond practicing skills, HFS provides an opportunity to think critically and to make decisions and communicate professionally through a safe, simulated patient encounter without a supervisor in the room.

When investigating inpatient rehabilitation as the setting that displayed the greatest increase in mean rank scores, findings showed mean rank increases in subsections of basic tenets, evaluation and screening, intervention, communication, and professional behaviors. This supports the collaborative, interdisciplinary nature of the inpatient rehabilitation setting in which occupational therapists, physical therapists, speech therapists, and other medical professionals communicate on a frequent basis to determine treatment priorities and improve outcomes. Strong interprofessional collaboration in the inpatient rehabilitation setting is supported in research done by Sinclair, Lingard, and Mohabeer (2009). A rehabilitation team's interdisciplinary skills are an important component in determining the success of the facility and patient outcomes (Körner, 2010). The interpersonal skills necessary for effective interdisciplinary patient care can be developed during simulation and are reflected in the above subsections of the FWPE/OTS. The basic tenets of practice subsection incorporates collaboration with the client; the communication subsection consists of effective verbal and nonverbal communication; and the professional behaviors subsection involves collaborating with a supervisor, responding constructively to feedback, and using positive interpersonal skills. Improvements in interprofessional skills after participating in HFS are also supported by Rossler and Kimble's (2015) study, in which prelicensure students' perceptions of readiness to work with other professions increased significantly after an interprofessional HFS experience.

Limitations

Several limitations may have affected our findings. A primary limitation of the study is the outcome measure used to gauge the students' clinical preparedness. Because the measure only discriminates between clinical competence and incompetence, there is a limited number of scores available to all students deemed competent. This creates a ceiling effect, which restricts the FWPE/OTS from indicating the level of student preparedness. In order to truly see the effect HFS training has on student performance during Level II FW, it may be beneficial to use a more discreet outcome measure.

Other limitations of this study include not accounting for faculty and minor curriculum changes during the 6 years from which the data was collected. During the time of the study, the academic fieldwork coordinator changed and modifications were made to the classes associated with FW. Individual differences among the students were also not analyzed in this study. The study is also limited in that the data reflects students from just one institution.

Conclusion

Increases in mean rank of the FWPE/OTS subsection scores in certain FW settings for students who received simulation training led to the preliminary conclusion that the HFS training may help to prepare OT students for clinical experiences. However, the FWPE/OTS does not possess fine enough resolution to evaluate students comprehensively, only to discriminate between students who have reached entry-level readiness and those who have not. Therefore, we recommend further research examining the impact simulation has on clinical preparedness using a more discriminatory outcome measure.

Implications for Practice

Previous studies in various health care fields have validated the use of simulation experiences to enhance student education and prepare them for clinical experiences. In this preliminary study to examine clinical outcomes related to HFS training in OT curriculum, the patterns toward an increase in FWPE/OTS subsection scores for the students that participated in a HFS experience may support findings from other health care fields and qualitative research from the OT field. While patterns from this preliminary quantitative study find that it may be beneficial for OT programs to implement simulation experiences in their didactic courses to further prepare students for clinical practice, further research should be done to build on this study.

Rebecca Ozelie, DHS, OTR/L, BCPR *is an Assistant Professor and the Academic Fieldwork Coordinator at Rush University in Chicago, IL. Dr. Ozelie is actively involved in research and teaching with a focus on physical disabilities, OT fieldwork outcomes and use of simulation. She has presented both internationally and nationally and has been published in various peer reviewed journals on the topics of spinal cord injury and OT fieldwork outcomes.*

Catherine Both, MS, OT; Emma Fricke, MS, OT; and Carolyn Maddock, MS, OT*; are graduates of Rush University in Chicago, IL. Ms. Both and Ms. Fricke are now both employed at Amy Zier and Associates. They have all presented nationally on this topic at the annual AOTA conference.*

References

American Occupational Therapy Association. (2002). *Fieldwork performance evaluation for the occupational therapy student.* Bethesda, MD: AOTA Press.

American Occupational Therapy Association. (2009). Occupational therapy fieldwork education: Value and purpose. *American Journal of Occupational Therapy*, *63*(6), 821-822. http://dx.doi.org/10.5014/ajot.63.6.821

Atler, K. (2003). *Using the Fieldwork Performance Evaluation forms: The complete guide.* Bethesda: AOTA Press.

Bethea, D. P., Castillo, D. C., & Harvison, N. (2014). Use of simulation in occupational therapy education: Way of the future? *American Journal of Occupational Therapy*, *68*(Suppl. 2), S32-S39. http://dx.doi.org/10.5014/ajot.2014.012716

Bradley, G., Whittington, S., & Mottram, P. (2013). Enhancing occupational therapy education through simulation. *The British Journal of Occupational Therapy*, *76*(1), 43-46. http://dx.doi.org/10.4276/030802213X13576469254775

Castillo, D. C. (2011). Experiences in a simulated hospital: Virtual training in occupational therapy. *OT Practice*, *16*(22), 21–23. Retrieved from: http://www.aota.org/-/media/Corporate/Files/Secure/Publications/OTP/2011-OTP/OTP%20Vol%2016%20Issue%2022.pdf

Cook, D. A., Hatala, R., Brydges, R., Zendejas, B., Szostek, J. H., Wang, A. T., . . .Hamstra, S. J. (2011). Technology-enhanced simulation for health professions education: A systematic review and meta-analysis. *The Journal of the American Medical Association*, *306*(9), 978-988. http://dx.doi.org/10.1001/jama.2011.1234

Fejzic, J., & Barker, M. (2015). Implementing simulated learning modules to improve students' pharmacy practice skills and professionalism. *Pharmacy Practice*, *13*(3), 583-590. http://dx.doi.org/10.18549/PharmPract.2015.03.583

Giles, A. K., Carson, N. E., Breland, H. L., Coker-Bolt, P., & Bowman, P. J. (2014). Conference Proceedings-Use of simulated patients and reflective video analysis to assess occupational therapy students' preparedness for fieldwork. *American Journal of Occupational Therapy*, *68*(Suppl. 2), S57–S66. http://dx.doi.org/10.5014/ajot.2014.685S03

Hedge, N., Neville, M. A., & Pickens, N. D. (2015). How patient educators teach students: Giving a face to a story. *The Open Journal of Occupational Therapy*, *3*(1), Article 4. http://dx.doi.org/10.15453/2168-6408.1143

Herge, E. A., Lorch, A., Deangelis, T., Vause-Earland, T., Mollo, K., & Zapletal, A. (2013). The standardized patient encounter: A dynamic educational approach to enhance students' clinical healthcare skills. *Journal of Allied Health*, *42*(4), 229-235.

Körner, M. (2010). Interprofessional teamwork in medical rehabilitation: A comparison of multidisciplinary and interdisciplinary team approach. *Clinical Rehabilitation*, *24*(8), 745-755. http://dx.doi.org/10.1177/0269215510367538

Kraft, S., Wise, H. H., Jacques, P. F., & Burik, J. K. (2013). Discharge planning simulation: Training the interprofessional team for the future workplace. *Journal of Allied Health*, *42*(3), 175-181. Retrieved from: http://sfx.carli.illinois.edu/sfxrsh?sid=Entrez%3APubMed&id=pmid%3A24013249&issn=0090-7421

Lewiss, R. E., Hoffmann, B., Beaulieu, Y., & Phelan, M. B. (2014). Point-of-care ultrasound education: The increasing role of simulation and multimedia resources. *Journal of Ultrasound in Medicine*, *33*(1), 27-32. http://dx.doi.org/10.7863/ultra.33.1.27

Obrien, J. C., & McNeil, S. D. (2013). Teaching effectiveness: Preparing occupational therapy students for clinical practice. *The Open Journal of Occupational Therapy*, *1*(3), Article 3. http://dx.doi.org/10.15453/2168-6408.1045

Richardson, K. J., & Claman, F. (2014). High-fidelity simulation in nursing education: A change in clinical practice. [Review]. *Nursing Education Perspectives*, *35*(2), 125–127. http://dx.doi.org/10.5480/1536-5026-35.2.125

Rossler, K. L., & Kimble, L. P. (2015). Capturing readiness to learn and collaboration as explored with an interprofessional simulation scenario: A mixed-methods research study. *Nurse Education Today*, *36*, 348-353. http://dx.doi.org/10.1016/j.nedt.2015.08.018

Saaranen, T., Vaajoki, A., Kellomaki, M., & Hyvarinen, M. L. (2015). The simulation method in learning interpersonal communication competence—Experiences of master's degree students of health sciences. *Nurse Education Today*, *35*(2), e8-e13. http://dx.doi.org/10.1016/j.nedt.2014.12.012

Sand, J. N., Elison-Bowers, P., Wing, T. J., & Kendrick, L. (2014). Experiential learning and clinical education. *Academic Exchange Quarterly*, *18*(4). Retrieved from: http://rapidintellect.com/AEQweb/5485l4.pdf

Shoemaker, M. J., Beasley, J., Cooper, M., Perkins, R., Smith, J., & Swank, C. (2011). A method for providing high-volume interprofessional simulation encounters in physical and occupational therapy education programs. *Journal of Allied Health*, *40*(1), e15-e21. Retrieved from: http://scholarworks.gvsu.edu/cgi/viewcontent.cgi?article=1000&context=simpubs

Shoemaker, M. J., Platko, C. M., Cleghorn, S. M., & Booth, A. (2014). Virtual patient care: An interprofessional education approach for physician assistant, physical therapy, and occupational therapy students. *Journal of Interprofessional Care*, *28*(4), 365-367. http://dx.doi.org/10.3109/13561820.2014.891978

Sinclair, L. B., Lingard, L. A., & Mohabeer, R. N. (2009). What's so great about rehabilitation teams? An ethnographic study of interprofessional collaboration in a rehabilitation unit. *Archives of Physical Medicine and Rehabilitation*, *90*(7), 1196-1201. http://dx.doi.org/10.1016/j.apmr.2009.01.021

Tomlin, G. (2005). The use of interactive video client simulation scores to predict clinical performance of occupational therapy students. *American Journal of Occupational Therapy*, *59*(1), 50–56. http://dx.doi.org/10.5014/ajot.59.1.50