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Abstract

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Keywords

Fieldwork, simulation, education

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Impact of Virtual Simulation-Based Level I Fieldwork on Level II Fieldwork Performance

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ABSTRACT

Fieldwork is an essential part of a student's education and development to become competent in entry-level occupational therapy skills (ACOTE, 2018). The implications of COVID-19 coupled with staffing shortages and an increase in academic programs resulted in academic fieldwork coordinators competing for a limited number of spots. The Accreditation Council of Occupational Therapy Education (ACOTE) integrated the use of simulation as an instructional method to meet Standard C.1.9 for Fieldwork I. This study used a retrospective cohort design to determine the impact of virtual simulation-based Level I fieldwork on performance in Level II fieldwork. Thirty-seven Doctor of Occupational Therapy students' Level II fieldwork performance evaluation scores were compared based on their placement in a traditional or simulation-based Level IA fieldwork. Nineteen students were reassigned to Simucase to complete their Level IA fieldwork due to COVID-19, and the remaining eighteen completed their traditional setting as scheduled. All students then completed a traditional Level IB. The Fieldwork Performance Evaluation (FWPE) was utilized by the students' fieldwork educators to assess their performance. There was no statistically significant difference between the students that completed the simulation-based Level I fieldwork and the students that completed both Level I experiences in person in their Level IIA and Level IIB FWPE scores ($p=0.683$, $p=0.889$). Additionally, there was no statistically significant difference found between the subsections on the FWPE between the two groups. The results of this study advance the current literature regarding the use of simulation-based experiences in occupational therapy education by displaying a comparable alternative to the traditional fieldwork model.

Introduction

Occupational therapy (OT) students must complete both Level I and Level II fieldwork experiences as part of curriculum requirements to become an OT. Level I fieldwork is an opportunity to implement didactic coursework through observation and participation in the occupational therapy intervention process (Accreditation Council for Occupational Therapy Education [ACOTE], 2018). Level II fieldwork is a minimum of 24 weeks, full-time, often completed in two diverse practice settings, to become competent in entry-level OT skills (ACOTE, 2018). These skills include application, research, administration, and management of occupational therapy services (ACOTE, 2018). Fieldwork experiences are essential to the education and development process for OT students. However, it has been increasingly challenging to find enough fieldwork placements for students. In addition, COVID-19-related fieldwork cancellations intensified the national fieldwork shortage and resulted in an enhanced need for innovative fieldwork experiences. Some OT programs have implemented simulation-based fieldwork to address these needs. Little research exists about the efficacy of simulation-based Level I fieldwork experiences. Therefore, the purpose of this research study is to analyze the impact of simulation-based Level I fieldwork on OT student performance on Level II fieldwork.

Fieldwork Availability and Shortages

Academic fieldwork coordinators (AFC) have been battling a shortage of fieldwork placements for students across the United States for several years (Mattila et al., 2020; Ryan et al., 2018; Schafer-Clay, 2019). Shortages have been a result of increased caseloads for practitioners, changes in reimbursement guidelines, overall staffing shortage, and growth in academic programs all causing increased fieldwork placement competition (Bethea et al., 2014; Quail et al., 2016). Fieldwork educators have also expressed time and workload as a barrier to fieldwork education over the past decade (Evenson et al., 2015). Many OT programs also struggle to accept placements from sites that have adopted a fee-for-placement plan due to financial concerns (Coppard et al., 2021). The fieldwork shortage has been exacerbated by COVID-19 creating restrictions on limiting patient exposure in healthcare settings, social distancing, and finding facilities willing to accept students during the pandemic (Dudzinsk, n.d.). While the impact of COVID-19 on fieldwork experience was most prominent at the beginning of the pandemic, limitations to placements remain despite the effects of COVID-19 becoming less acute. Decreased fieldwork availability and COVID-19 have impacted some students' ability to meet professional requirements like fieldwork due to significant cancellations in skilled nursing facilities and school settings (Mattila et al., 2020).

Due to the challenges facing the viability of fieldwork, the American Occupational Therapy Association (AOTA) Board of Directors established an Ad Hoc Committee to explore alternative models to experiential learning in 2016. ACOTE (2018) integrated recommendations from this committee and allowed for the use of simulation as an instructional method to meet Standard C.1.9 for Level I fieldwork. In alignment with Standard C.1.9, students can utilize a virtual setting that reflects an augmented reality and real-world environment for their Level I fieldwork (ACOTE, 2018). Faculty across

the country are in search of pragmatic and evidence-based modalities to meet the demands of curricula using simulation-based learning (Mattila et al., 2020). The use of simulation as a teaching methodology is not new to the field, as it has been utilized throughout OT education in various contexts.

Simulated Learning

Simulated learning experiences have been utilized in conjunction with intervention courses, to prepare students for their future fieldwork experiences (Lucas Molitor & Nissen, 2020). Depending on the objective of the lesson, level of fidelity, or type of simulation, the programs can demonstrate hospital setups, real equipment, and standardized patients (Lucas Molitor & Nissen, 2020) to prepare students using clinical scenarios. When students utilized simulated lab experiences before Level II fieldwork, their Fieldwork Performance Evaluation (FWPE) scores were higher in communication, professional behavior and evaluation, and screening subsections (Ozelie et al., 2016) than students that did not participate in simulation lab experiences. Providing students with additional learning experiences allows them to gain confidence in their clinical skills and practice independence with interventions.

Simulated patients have been found to positively affect OT students' preparedness for Level II fieldwork experiences (Giles et al., 2014). Results on a comprehensive practical exam showed that applying knowledge a student has learned in the classroom to a clinical simulated situation allowed them to effectively transition from didactic content to integrated clinical work and helped students understand what it takes to become an effective practitioner (Giles et al., 2014). Complex simulated learning can help transition students with confidence into their Level II fieldwork experience, in turn, making them more prepared.

A review of the impact of simulation in OT education over the last 10 years resulted in the identification of major themes (Grant et al., 2021). It has been positively received by OT students when provided with authentic, interactive simulation and professional standards and competencies (Grant et al., 2021). Students understand the value that hands-on learning provides to their readiness for practice. Since it can be implemented into their education and provide effective learning outcomes, traditional setting fieldworks in some cases have been replaced by simulation-based fieldwork experiences. One platform widely utilized for simulation-based Level I fieldwork is Simucase.

Simucase Alternative Fieldwork

Simucase is a simulated program made for students to learn and practice competency-based skills online. The platform library includes interactive simulations that can be filtered to a specific topic area, age, and/or session type (Simucase, 2022). Simucase has a database for OT that allows students to explore patient populations ranging from birth to geriatric in the following locations: outpatient settings, schools, hospitals, private practice, community settings, home health, and independence and assistance programs (Simucase, 2022).

In 2021, AOTA surveyed the number of students who had disruptions to their Level I fieldwork due to COVID-19. It was found that 58% of the student respondents experienced a cancellation (AOTA, 2020). Due to the inability of many students to be in-person amid COVID-19, some were assigned to simulation-based experiences for Level I fieldwork including the use of Simucase. Simucase has noted benefits including cost-effectiveness, real patient stories, prompt feedback, and a safe learning environment (Deluliis et al., 2021). Students who completed their Level I fieldwork on Simucase perceived the same amount of increased knowledge and confidence as their peers in traditional settings (Ozelie et al., 2022). Satisfaction scores of students using Simucase resulted in a significant improvement in satisfaction related to debrief and reflection sessions and ability to articulate their clinical reasoning (Mattila et al., 2020). With COVID-19 as the precursor and emerging evidence demonstrating the effectiveness, simulation-based Level I fieldwork is gaining popularity.

Level I Fieldwork Impact on Level II Fieldwork

Level I fieldwork, as outlined by ACOTE (2018), is designed to enhance coursework by observing and interacting with patients in a designated area of practice. This provides foundational skills for the OT student to continue onto their Level II fieldwork. Level II fieldwork requires OT students to demonstrate entry level competence of occupational therapy services (ACOTE, 2018). Level II fieldwork is the final opportunity to practice clinical skills before the National Board for Certification in Occupational Therapy (NBCOT) exam. Level II fieldwork offers students the unique opportunity to apply their knowledge to practice, under the supervision of a licensed occupational therapist. The students are prepared with didactic content from the academic program's curriculum, hands-on experience, and Level I fieldwork experience.

Fieldwork educators expect their students to be technically skilled in communication, planning and implementing interventions (Mason et al., 2020) which are skills that can be addressed on Level I fieldwork. The entry-level competence needed to be successful in Level II fieldwork is a combination of experiences a student has in and out of the classroom. What is currently unknown, is how the experience of a simulated Level I fieldwork impacts successful performance on Level II fieldwork. Therefore, the objective of this research study is to discover the impact of a hybrid simulation-based Level I fieldwork on OT students' performance on Level II fieldwork.

Methods

Research Design

A retrospective cohort design was utilized to compare student performance on Level IIA/B fieldwork. The data used for analyses was de-identified and the study was approved by a University Institutional Review Board as a quality improvement project.

Participants

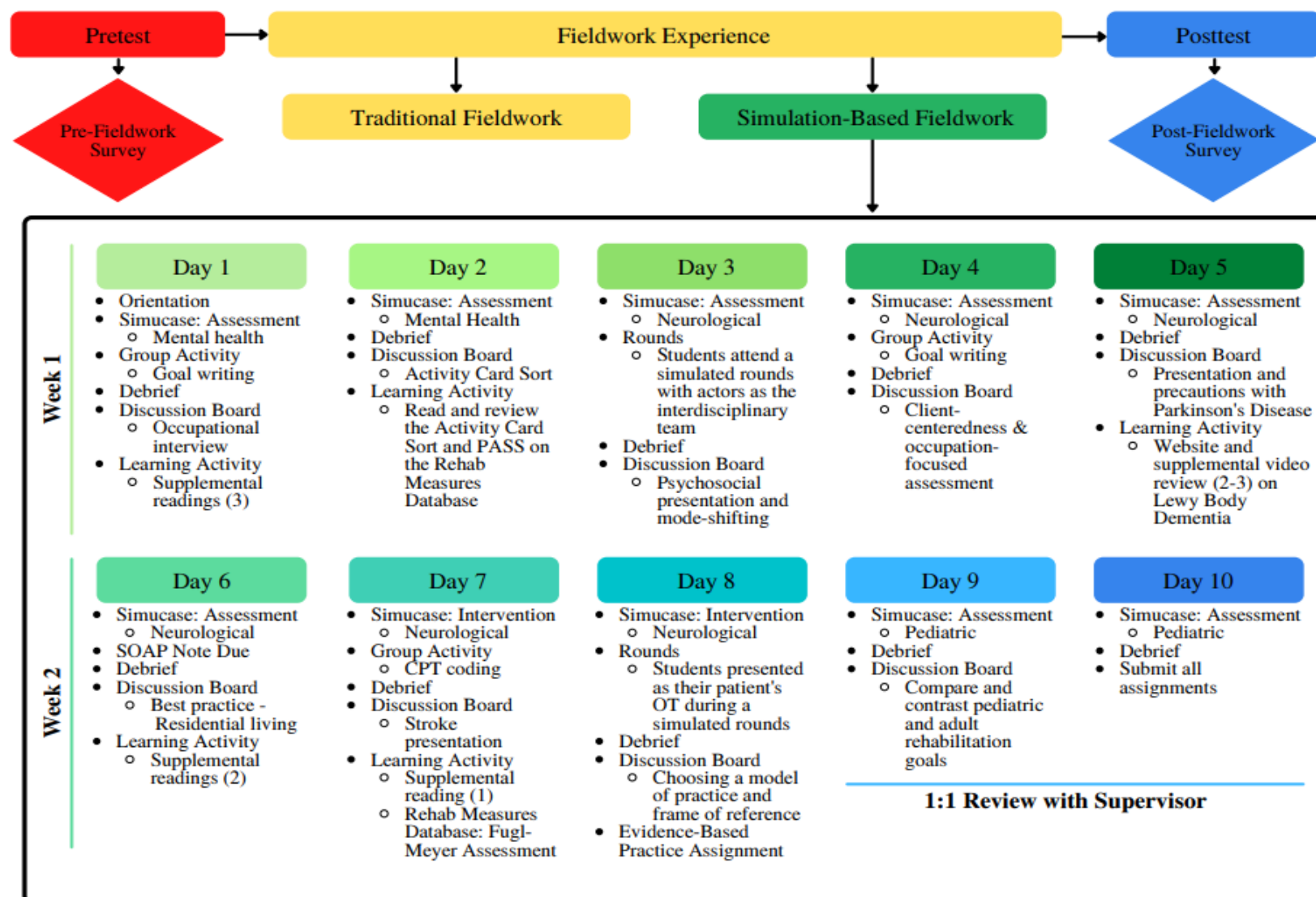
This study used a convenience sample from a private university in the Midwest. The participants were first-year, entry-level doctoral students from a 3-year program. All students were female OT students (n = 37) who were assigned a Level IA fieldwork in August 2020. All students were assigned traditional Level I fieldwork settings until site

cancellations due to COVID-19 restrictions resulted in 18 students being reassigned to simulation-based fieldwork for their first Level IA experience followed by a traditional Level IB experience the following semester. This group is referred to as the hybrid group. The remaining students completed their Level IA fieldwork in person, as scheduled, and the Level IB in person as well, representing the traditional group. Inclusion criteria consist of doctorate students within the cohort that completed simulation-based or traditional Level IA fieldwork, traditional Level IB fieldwork, and traditional Level IIA and IIB fieldwork. There were no exclusion criteria for this study.

Procedure

Traditionally students at the affiliated university complete two Level I fieldwork experiences that are two weeks full-time in clinical or community settings and supervised by qualified personnel. Students are required to pass both Level I fieldworks before participating in Level II fieldwork. Virtual simulation-based fieldwork utilizing Simucase software (Simucase, 2022) was used for 18 students whose Level IA fieldwork placements were canceled due to COVID-19 in August 2020. The students that participated in this virtual simulation-based Level I fieldwork will be referred to as the “hybrid group”. All participants in the hybrid group were assigned the same virtual cases. The two-week fieldwork represented three practice settings utilizing Simucase: mental health, physical disabilities, and pediatrics. Students spent approximately 75% of their workday completing Simucase cases. In addition to the simulated cases, the Simucase program was supplemented with condition-specific virtual debrief sessions, learning activities, and discussion boards as seen in Figure 1. These virtual, supplemental activities made up the remaining 25% of the students’ times. Students met virtually with a licensed and registered occupational therapist at the end of each day to debrief and process what they had learned for 30-45 minutes. Students in both the hybrid and traditional groups had similar time requirements, assignments, objectives, and evaluation methods to ensure the Level I fieldwork experiences were comparable in rigor.

The remaining 19 students attended their Level IA fieldwork in person as scheduled. These students spent two weeks full-time in their respective settings supervised by qualified personnel and were able to engage in directed observation and participation in the OT process. All 37 students completed a traditional Level IB fieldwork that was full-time for two weeks, in person. Two Level II fieldwork experiences follow the Level IA and Level IB fieldwork. Level II fieldwork must equal a total of 24 weeks full-time and be reflective of more than one practice area but no more than four different settings (ACOTE, 2018). Level II fieldwork for students was completed in two 12-week experiences (Level IIA and Level IIB). Each of these experiences are full-time and aimed at progressing the students to entry-level clinical skills. Following Level IIA and Level IIB, data was routinely collected within the University’s Department of Occupational Therapy Clinical Practice Skills and Advanced Fieldwork courses for analysis. Clinical instructors (CI) evaluated their students’ performance using a standardized evaluation form, the AOTA Fieldwork Performance Evaluation (FWPE; AOTA, 2020a). The data from this evaluation for both Level IIA and Level IIB was analyzed.

Figure 1*Study Design*

Measure

The FWPE measures entry-level competency of OT students. Students are ranked in each category by their fieldwork educator on a Likert scale ranging from unsatisfactory performance = 1 to exemplary performance = 4 to assess student competency. The evaluation tool consists of six categories and 37 total performance items. The six categories assessed include Fundamentals of Practice, Basic Tenets, Screening and Evaluation, Intervention, Management of Occupational Therapy Services, and Communication and Professional Behaviors (FWPE; AOTA, 2020a). This evaluation is the most widely accepted fieldwork evaluation utilized and has been found to have content validity (Preissner et al., 2020).

Data Analysis

Data and descriptive information were analyzed using the Statistical Package for the Social Sciences (SPSS), Version 22 (IBM Corp., 2019). An independent t-test was performed to compare differences in Level II fieldwork performance among students that completed the traditional Level IA experiences and those that completed the simulation-based Level IA experiences.

Results

A total of 37 female students with an average age of 22.05 participated in all four fieldwork experiences. The 19 students in the traditional IA group were placed in outpatient, acute, rehabilitation, pediatric, or psychosocial settings. Students were placed in these same practice settings for their Level IIA and IIB. See Figures 2-4 for the distribution of fieldwork practice settings for each experience. When analyzing the total FWPE scores for Level IIA there was no significant difference between the two groups ($p=0.683$). Additionally, no significant difference was found between Level IIB FWPE scores ($p=0.889$). Subsections of the FWPE were analyzed independently for both Level IIA and Level IIB showing no significant difference in subsection scores among traditional and hybrid fieldwork groups (see Table 1 & 2). All students in both groups passed the FWPE with scores greater than 111. The mean FWPE score for Level IIA was 0.34 points higher for the traditional group. The mean FWPE score for Level IIB was 3.7 points higher for the hybrid group.

Figure 2

Level IA Practice Settings

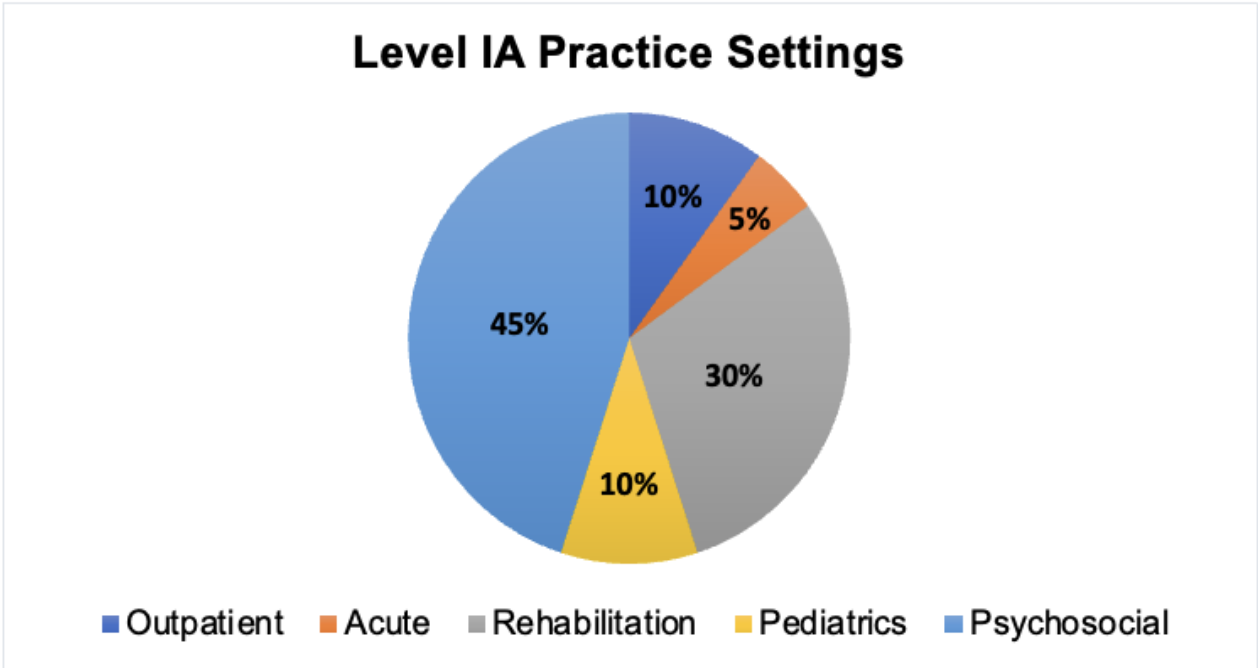


Figure 3

Level IIA Practice Settings

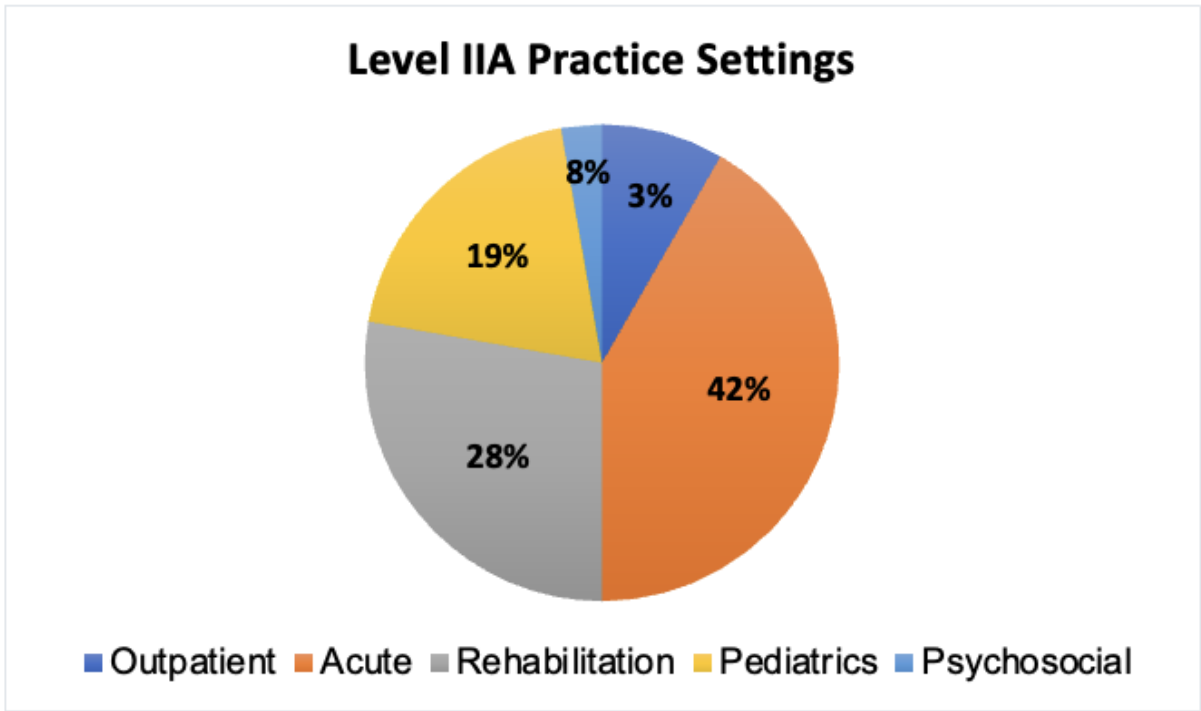


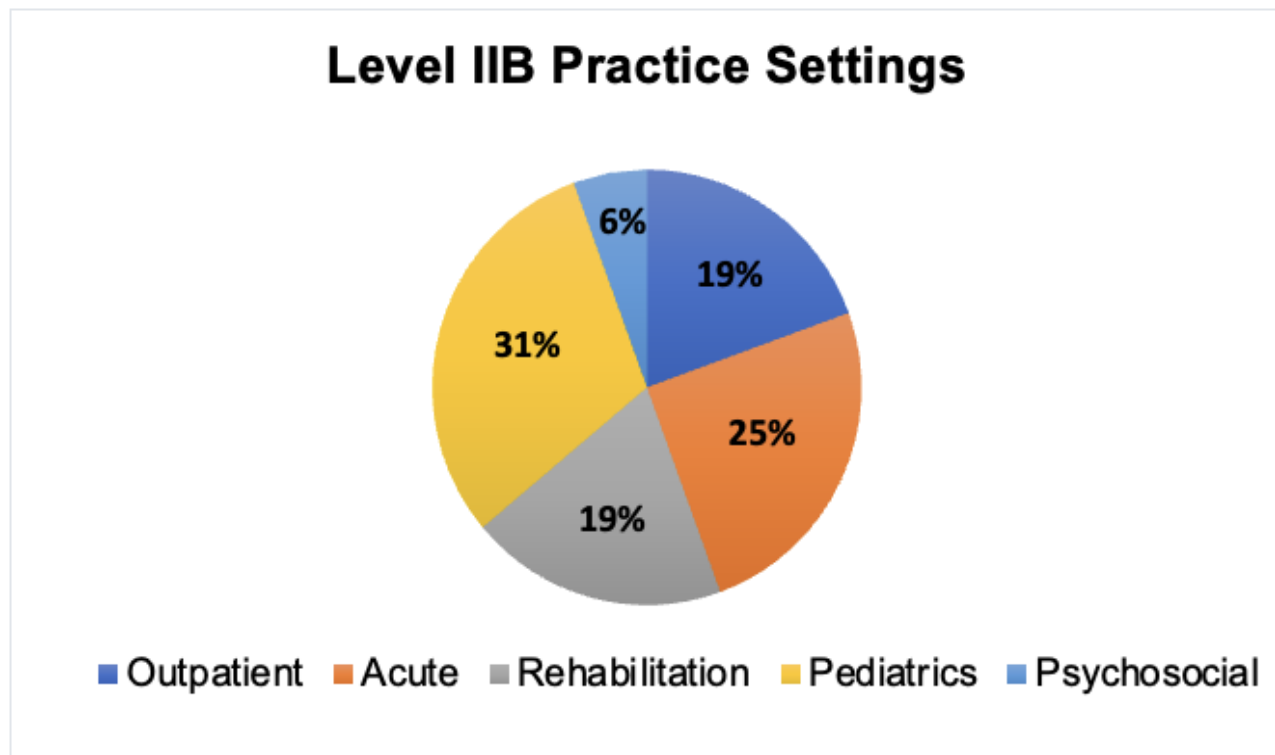
Figure 4*Level IIB Practice Settings*

Table 1

Level IIA Fieldwork Performance Evaluation Subsections

	IA Setting	N	Mean	SD	t	df	Sig. (2-tailed)
Fundamentals of Practice	Simucase	17	10.18	1.286	-0.383	34	0.704
	Traditional	19	10.16	1.385			
Basic Tenets	Simucase	17	10.06	1.345	-1.151	34	0.258
	Traditional	19	10.00	1.155			
Screening and Evaluation	Simucase	17	30.24	2.705	-0.045	34	0.964
	Traditional	19	28.89	2.726			
Intervention	Simucase	17	30.06	3.01	0.914	34	0.367
	Traditional	19	26.74	2.535			
Management of OT Services	Simucase	17	13.29	1.263	-0.783	34	0.439
	Traditional	19	12.68	0.671			
Communication and Professional Behaviors	Simucase	17	32.82	2.555	-0.285	34	0.778
	Traditional	19	31.47	3.255			

Table 2

Level IIB Fieldwork Performance Evaluation Subsections

	IA Setting	N	Mean	SD	t	df	Sig. (2-tailed)
Fundamentals of Practice	Simucase	17	10.18	1.286	0.042	34	0.967
	Traditional	19	10.16	1.385			
Basic Tenets	Simucase	17	10.006	1.345	0.141	34	0.889
	Traditional	19	10.00	1.155			
Screening and Evaluation	Simucase	17	30.24	2.705	0.478	34	0.149
	Traditional	19	28.89	2.726			
Intervention	Simucase	17	30.06	3.010	0.348	34	0.730
	Traditional	19	29.74	2.535			
Management of OT Services	Simucase	17	13.29	1.263	1.837	34	0.075
	Traditional	19	12.68	0.671			
Communication and Professional Behaviors	Simucase	17	32.82	2.555	1.372	34	0.179
	Traditional	19	31.47	3.255			

Discussion

The results from the independent t-tests showed no significant differences in Level IIA or IIB FWPE scores between students that completed the traditional or hybrid Level I fieldwork. Additionally, no significant differences were found within the subsections of the Level II FWPE between the two groups. These findings provide preliminary, quantifiable evidence that simulation-based Level I fieldwork in combination with traditional level I fieldwork is a viable option to successfully prepare students for their Level II fieldwork experiences. The simulation platform used in this study, Simucase, can be personalized to desired learning objectives, and the developmental level of the student, and expose students to patients of varying ages, diagnoses, and settings (Deluliis et al., 2021). The ability to personalize the experience with a variety of factors may contribute to the effectiveness of this simulation-based Level I fieldwork. Students have also expressed satisfaction with the Simucase platform's ability to provide immediate feedback through debrief and allowance for collaboration with other classmates and instructors (Harris et al., 2022). When Simucase was utilized, students were able to demonstrate how coursework can be applied across the curriculum to clinical experiences (Giles et al., 2014). The results of this study support the use of Simucase as part of an effective Level I fieldwork experience.

In addition to the use of the Simucase technology, students were divided into small groups to take part in supplemental learning activities, treatment planning, discussion boards, and debrief meetings. The debrief meetings were a critical component of the hybrid group's Level I fieldwork experience. Debriefs occurred daily with their assigned clinical instructor to discuss the assigned cases, clinical reasoning, specifics about diagnoses and interventions, and address student questions intending to facilitate the clinical reasoning of each student. The importance of debriefing is supported by the findings of Ryoo and Ha (2015) who compared the clinical performance, competency, and satisfaction of nursing students with and without debriefing in simulation-based learning experiences. Debriefing was found to maximize success and result in higher performance, competency, and satisfaction for the students that received debriefing (Ryoo & Ha, 2015). Decker et al. (2021) emphasized simulation standards of best practice involving debriefing to enhance learning, clinical competence, transfer of knowledge, and self-confidence to ensure the quality of patient care. The emphasis on daily debriefing utilized in this study was likely a critical component of the experience and development of students' competency on fieldwork.

The students assigned to Simucase worked with mental health, physical disabilities, and pediatric populations within their 2-week fieldwork. The current ACOTE standards state "students should be exposed to a variety of clients across the lifespan and a variety of settings" (ACOTE, 2018, p. 38). The hybrid fieldwork group may have benefited from being exposed to multiple settings, whereas the traditional group was assigned to a single practice setting. Clinical reasoning skills can be difficult to teach, but fieldwork provides students with the opportunity to implement those skills and develop competency (Holmes et al., 2010). Literature suggests that students need to work with a diverse population of clients to learn treatment approaches and strengthen their scope

of practice (Holmes et al., 2010). Students may have a hard time applying clinical reasoning to a setting or population that they have not yet had experience in treating and the variety of settings offered to the hybrid group may have aided in the success of students on Level II fieldwork.

When considering the outcomes of this study it is important to also acknowledge the impact of the didactic component of the curriculum in addition to the diversity of student-learning experiences. All students equally participated in didactic coursework before Level II fieldwork. Participants in this study all were required to complete the same coursework before beginning their first fieldwork experience. Didactic coursework is consistently updated and adapted to best prepare students to meet the rigor of Level II clinical practice (Knecht-Sabres et al., 2013). How students perform in Level II fieldwork can provide feedback to a program on how well their curriculum has prepared them for clinical practice (Knecht-Sabres et al., 2013). Considering there was no significant difference between the FWPE scores for the traditional and hybrid groups, the impact of the didactic content and the ability of that information to adequately prepare students for Level II fieldwork must be acknowledged.

Using the Simucase platform during COVID-19 may have helped to address the nationwide fieldwork shortage. The hybrid group benefited from Simucase taking the place of their cancelled fieldwork and having it followed up with a traditional Level IB fieldwork. Fieldwork coordinators from across the United States struggled to find placements amid social distancing and contact guidelines in hospitals and clinics (Ozelie et al., 2022). Haynes (2011) identified that students have reported varying levels of education from primarily observation to active participation within their Level I fieldwork experiences. Students shared that their most valuable learning experiences involved participating in the clinical reasoning process (Haynes, 2011). Occupational therapy faculty have acknowledged how Simucase provides a safe learning environment where the students could develop their clinical reasoning, treatment planning, and skills in problem solving and decision making (Ozelie et al., 2022). The hybrid group was able to experience a unique fieldwork during COVID-19 and participate in a traditional Level IB to adequately prepare them for Level II experiences.

Limitations

The study utilized a small, homogeneous, convenience sample from one academic medical university in the Midwest. The type of sample may limit the generalizability of study findings. Additionally, the two group sizes were not equal which may have an impact on the statistical significance. The study also assessed fieldwork performance scores amidst COVID-19 that may have impacted academic competency, social participation, and clinical opportunities. An additional limitation is that the FWPE allows for a degree of rater subjectivity and potential bias. The FWPE's purpose is to singularly determine entry-level clinical competence and not performance above that. This can result in a ceiling effect that impacts the statistical usefulness of the measure.

Implications for Occupational Therapy Education

- Simulation-based Level I fieldwork is a viable option when coupled with a traditional Level I experience that can not only address the fieldwork shortage but also provide students with appropriate preparation for Level II fieldwork
- With the continuation and likely long-standing effects of COVID-19 as well as technological advances, the incorporation of simulation platforms like Simucase should be explored further to develop quality simulation-based Level I fieldworks that promote student competency.

Conclusion and Recommendations for Future Research

A simulation-based Level I fieldwork in combination with a traditional Level I experience is a viable option to adequately prepare students for Level II fieldwork. Utilization of simulation-based fieldwork coupled with in-person experiences results in synonymous performance for Level II fieldwork when compared to all in person experiences. This study should be replicated with a larger and more diverse sample size to increase generalizability as well as increase the validity of the study. Moreover, as the FWPE may be subject to bias, it may not accurately determine a student's comprehensive performance. Therefore, we recommend further research exploring the impact of simulation fieldwork experiences on clinical performance using a different outcome measure. It is also important to explore if simulation-based experiences alone for Level I fieldwork is a viable option to adequately prepare students for Level II fieldwork when compared to solely traditional Level I experiences. We also suggest a future study that explores the impact simulated-based fieldwork experiences have on National Board for Certification in Occupational Therapy (NBCOT) exam scores.

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