

2021

Needs Assessment, Program Development, and Pilot Testing: Training for Occupational Therapy Students Working with Survivors of Gun Violence

Lea Fang

Washington University School of Medicine

Aisha Mohammed

Washington University School of Medicine

Vicki Kaskutas

*Washington University School of Medicine*Follow this and additional works at: <https://encompass.eku.edu/jote>Part of the [Occupational Therapy Commons](#)

Recommended Citation

Fang, L., Mohammed, A., & Kaskutas, V. (2021). Needs Assessment, Program Development, and Pilot Testing: Training for Occupational Therapy Students Working with Survivors of Gun Violence. *Journal of Occupational Therapy Education*, 5 (4). <https://doi.org/10.26681/jote.2021.050418>

This Educational Innovations is brought to you for free and open access by the Journals at Encompass. It has been accepted for inclusion in Journal of Occupational Therapy Education by an authorized editor of Encompass. For more information, please contact laura.edwards@eku.edu.

Needs Assessment, Program Development, and Pilot Testing: Training for Occupational Therapy Students Working with Survivors of Gun Violence

Abstract

After the first year of operation, members of a student-staffed occupational therapy (OT) clinic found that 36% of their patients' injuries were violence-related, mostly due to gun violence. The purposes of this project were to identify unmet needs of survivors of violence seen in a clinic setting, identify treating professionals' preparedness to meet these needs, and develop and pilot test a program within the scope of OT to address these needs. A literature review and key informant interviews, surveys, and focus groups identified potential solutions to address gaps between patients' needs and professionals' preparedness to meet those needs. The need for student training was prioritized and a one-hour electronic module was developed using peer-reviewed literature, content matter expert input, and evidence-based teaching and learning strategies. The training utilized interactive activities to help learners reflect on personal beliefs and biases, recognize relevant person and environment factors, understand underlying causes of gun violence, gain trauma-informed communication skills, and identify referral options. To pilot test the training, eight first-year OT students completed the training and pre- and post-surveys measuring knowledge and attitude changes. The mean knowledge score improved from 78% correct pre-training to 97% correct post-training, with improvement in one item statistically significant at $p=0.025$. Four items measuring attitudes also demonstrated statistically significant improvements post-training. Participation in this training program can help OT students develop the knowledge, attitudes, and skills to work with patients who have experienced trauma from community gun violence.

Keywords

Needs assessment, program development, gun violence, student clinic

Creative Commons License



This work is licensed under a [Creative Commons Attribution-Noncommercial-No Derivative Works 4.0 License](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Acknowledgements

The authors would like to acknowledge content matter experts, healthcare professionals, current and previous HT-SELC members and patients, and OT student participants for their time and participation in our project. The authors would also like to thank Dr. Duana Russell-Thomas, OTD, OTR/L and Dr. Quinn Tyminski, OTD, OTR/L for their continued help as content matter experts and guidance with program development.

Needs Assessment, Program Development, and Pilot Testing: Training for Occupational Therapy Students Working with Survivors of Gun Violence

Lea Fang, OTD, OTR/L

Aisha Mohammed, BA

Vicki Kaskutas, OTD, OTR/L, FAOTA

Washington University School of Medicine

United States

ABSTRACT

After the first year of operation, members of a student-staffed occupational therapy (OT) clinic found that 36% of their patients' injuries were violence-related, mostly due to gun violence. The purposes of this project were to identify unmet needs of survivors of violence seen in a clinic setting, identify treating professionals' preparedness to meet these needs, and develop and pilot test a program within the scope of OT to address these needs. A literature review and key informant interviews, surveys, and focus groups identified potential solutions to address gaps between patients' needs and professionals' preparedness to meet those needs. The need for student training was prioritized and a one-hour electronic module was developed using peer-reviewed literature, content matter expert input, and evidence-based teaching and learning strategies. The training utilized interactive activities to help learners reflect on personal beliefs and biases, recognize relevant person and environment factors, understand underlying causes of gun violence, gain trauma-informed communication skills, and identify referral options. To pilot test the training, eight first-year OT students completed the training and pre- and post-surveys measuring knowledge and attitude changes. The mean knowledge score improved from 78% correct pre-training to 97% correct post-training, with improvement in one item statistically significant at $p=0.025$. Four items measuring attitudes also demonstrated statistically significant improvements post-training. Participation in this training program can help OT students develop the knowledge, attitudes, and skills to work with patients who have experienced trauma from community gun violence.

Introduction

Gun violence is a public health crisis in the United States (U.S.) that stems from systems of inequity (Kuhls et al., 2017). Communities in the U.S. are impacted by violence disproportionately, with black Americans ten times more likely to die from firearm homicide compared to white Americans (Everytown Research & Policy, 2020). The COVID-19 pandemic has spurred even further growth of these health inequities, with gun violence spiking across many major U.S. cities (Sutherland et al., 2020). For example, in St. Louis, Missouri, where the Hand Therapy Student Experiential Learning Clinic (HT-SELC) is located, an increase in gun violence of 16.2% and homicides of 33.3% occurred from January through October of 2020 compared to 2019 (St. Louis Metropolitan Police Department, 2020). The pandemic “exacerbated factors that contribute to interpersonal violence, including financial stress, tension, trauma, worry, and a sense of hopelessness” (Schleimer et al., 2020). Alongside the pandemic, repeated media coverage of the deaths of Breonna Taylor, George Floyd, Ahmaud Arbery and many others has highlighted inequities and evoked similar tensions and trauma in communities nationwide.

In response to the events of 2020 related to systemic injustices, the American Occupational Therapy Association (AOTA) announced an official statement that a commitment to “equity, inclusion, and diversity is a critical pillar of our Vision for the future, leading to an inclusive profession that maximizes health, well-being, and quality of life for all people, populations, and communities” (AOTA, 2020a). Occupational therapy (OT) practitioners work with survivors of gun violence along the continuum of care, including but not limited to, in hospitals directly post-injury, in clinics for rehabilitation, and within community programming. Occupational therapy practitioners working with survivors of gun violence must be aware of the widespread impact that gun violence can have on the survivor, their family, and the community. Occupational therapy practitioners have a responsibility to consider the context of health inequities and trauma's impact on occupational performance, use appropriate and inclusive communication, and provide interventions to maximize health, well-being, and quality of life.

This project describes the process that the HT-SELC, a pro-bono clinic in an OT program in St. Louis, undertook to improve the clinic's ability to work with survivors of gun violence. The HT-SELC was developed to help meet the therapy needs of individuals who receive pro-bono medical and surgical care by hand surgeons at the large medical center affiliated with the University. Faculty developing the HT-SELC explored a wide range of contextual factors, such as poverty rates and health insurance coverage of the population, but they did not anticipate that 36% of the patients seen in the clinic's first year would be survivors of violence, with 78% of those injuries due to gun violence (McAndrew & Kaskutas, 2020b). A logic model (McAndrew & Kaskutas, 2020a) was used to systematically plan the HT-SELC. However, shortcomings in the contextual assessment, which resulted in inadequate clinic inputs and learning activities, were identified through iterative process evaluation. Student clinicians understood the anatomy of the upper extremity (UE) and were able to administer the clinic's evaluation protocol and provide interventions directed at the UE. However, they

struggled to manage the psychological symptoms that their patients were facing, such as intense emotional expression and intimate self-disclosures. As students gained a deeper awareness of the systemic health inequities their patients faced in the surrounding community, the drive to understand and address these inequities grew.

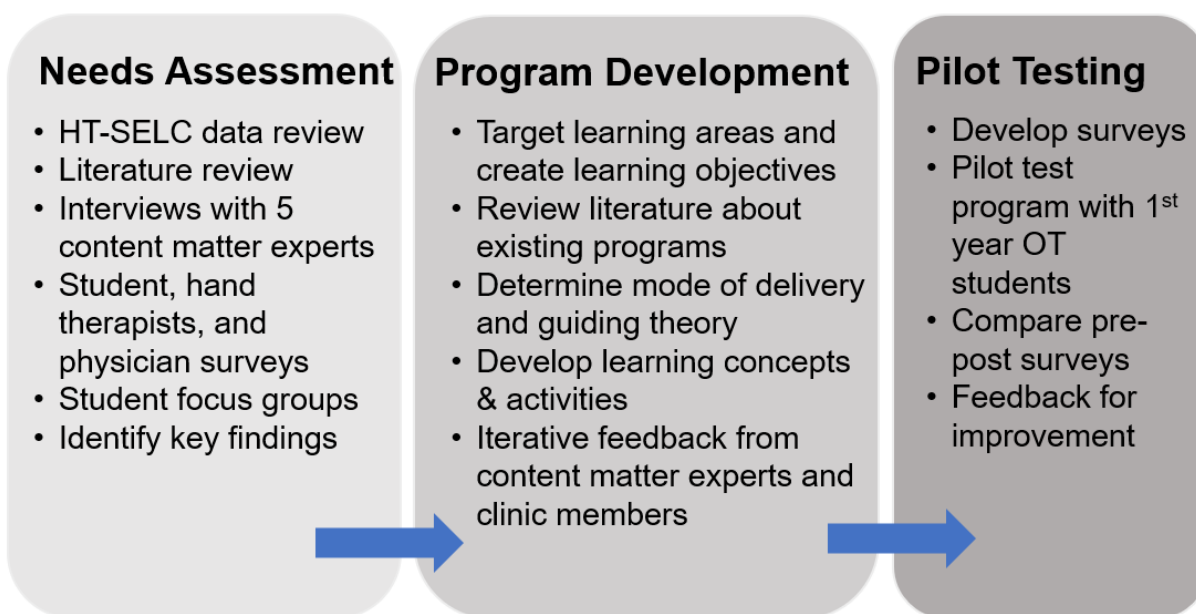
The aims of this project were to identify unmet needs of survivors of violence seen in a pro-bono clinic setting, identify treating professionals' preparedness to meet these needs, and develop and pilot test a program within the scope of OT that helps address these needs.

Project Overview and Community Context

The three phases of this project are outlined in Figure 1, with each phase informing following phases. Each phase will be discussed in detail below.

Figure 1

Three Phases of Project



This project took place in the HT-SELC, a pro-bono clinic in an OT master's and doctorate entry-level level program in St. Louis. This clinic provides OT services to adult patients with UE conditions who are medically uninsured or underinsured. In addition to participating in entry-level coursework, student clinicians in this clinic complete immersive hand therapy specific training, which includes knowledge quizzes and competency evaluations. Second year students provide direct care under the supervision of one of the two licensed clinicians and a third-year peer mentor who has completed a Level two fieldwork experience in a hand therapy setting. Details about the logic model, HT-SELC, and first semester outcomes were published (McAndrew & Kaskutas, 2020a; McAndrew & Kaskutas, 2020b).

Needs Assessment

To perform the needs assessment, data was gathered from various sources to identify unmet needs of survivors of violence seen in the HT-SELC and preparedness of treating professionals to meet these needs. The needs assessment included six main components performed in sequential order (see Figure 1), as each activity informed the following ones. The University's Institutional Review Board (IRB) determined that the needs assessment portion of this project was for educational and quality improvement, so IRB approval was not necessary.

HT-SELC Data

Demographic data from the HT-SELC's IRB approved patient registry database was explored. Data was obtained from the first three semesters and out of the sample of 26 patients, ten sustained their UE injuries due to violence. All ten of these individuals were African American, half were female and male respectively. Five participants were between the ages of 30-39, three were 18-29, and two were over 40. Six of the patients with UE violence-related injuries (UEVI) were unemployed (60%), a percentage substantially higher than the unemployment rate of 4% in the city of St. Louis at the time (Bureau of Labor Statistics, 2019). Ninety percent of HT-SELC patients with UEVI lived in zip codes identified as high need areas indicated by health inequities, such as uninsured households, avoidable hospitalizations, and low birth weights (St. Louis Regional Health Commission, 2003). Several of these zip codes include neighborhoods with large numbers of uninsured individuals and population living below the federal poverty level (St. Louis Regional Health Commission, 2018).

Literature Review

The literature review explored the prevalence of violence and gun violence and the impact of health disparities in St. Louis, psychosocial aspects of trauma to the UE, complexities of surviving a violent injury, and the underinsured and uninsured patient population. Peer-reviewed articles combining the topics of hand or OT and violence or gun violence were very limited, so articles that independently explored the impact of violence, gun violence and occupational and/or hand therapy for individuals with hand and/or UE conditions were explored.

Individuals with traumatic hand and UE injuries experience a high rate of psychological distress that extends beyond post-operative and rehabilitation time periods (Richards et al., 2011). Stress, discouragement, and loss of confidence can impair a person's adjustment to changes in UE function and appearance (Daud et al., 2016; Tocco et al., 2011). Addressing psychological symptoms in therapy early on, and establishing a trusting relationship with the survivor that allows them to feel safe enough to share how they are feeling, may be crucial to identifying and preventing development of chronic stress, anxiety, and depression (Hannah, 2011; Ladds et al., 2017).

Injury to the UE due to gun violence can impact all areas of an individual's life and occupational performance, including managing activities of daily living, sleep and rest, and work (Francis, 2018; Patton et al., 2019; Pereira et al., 2012). Emotional distress and impaired social relationships are common after an encounter with gun violence

(Boccellari et al., 2007; Kagawa et al., 2018; Langton & Truman, 2014; Riley et al., 2015). Individuals who sustain or witness an act of violence are likely to experience symptoms of post-traumatic stress, including depression, anxiety, and substance use (Corbin et al., 2010; Lynch, 2003), as well as toxic stress, all of which can lead to worse health outcomes (Corbin et al., 2010; Fowler et al., 2015). Experiences of violence and trauma can also impact an individual's levels of engagement in healthcare (Reeves & Humphreys, 2018). Survivors of gun violence are more likely to be repeat victims of gun violence (Hargarten et al., 2018).

Social and economic disparities exist in the St. Louis metropolitan area based on geographical location and racial demographics. Historical policies and systemic practices have created areas of concentrated social and economic disadvantage. For example, racially restrictive housing practices, such as redlining and restrictive deed covenants, limited where African Americans could obtain housing prior to the enactment of the Fair Housing Act of 1968 (Lartey, 2017). Many of the original redlined areas in St. Louis are still areas of racially concentrated poverty (Cambria et al., 2018). Poverty can heavily influence one's overall health status and can contribute to a number of stressors, such as living in high crime neighborhoods and encountering job scarcity (Anderson et al., 2003). The majority of zip codes with high rates of individuals who have experienced violence are in the City limits and in North County (St. Louis Regional Health Commission, 2012). This has direct ties to firearm injuries, which rates of are 12 times higher in the St. Louis City limits and 16 times higher in St. Louis County in African Americans than in white Americans (Washington University in St. Louis and St. Louis University, 2015). In addition, in African Americans, 87% of deaths due to homicide in St. Louis City are due to firearms (Washington University in St. Louis and St. Louis University, 2015).

Content Matter Expert Interviews

Five interviews were conducted with seven content matter experts by the student authors. The content matter experts consulted had backgrounds in providing trauma-informed care, crime victim advocacy, gun violence prevention, and/or mental health services, as well as contextual knowledge of St. Louis. Five had backgrounds in social work and two were occupational therapists. Interview questions were initially developed by combining information obtained through literature review as well as thorough researching of the expert via their associated institution. Consecutive interviews built on the previous ones, as information obtained from prior interviews were integrated into the question development that followed. Following each interview, the student authors independently reviewed notes to identify key points from each expert. Once key points were identified, the student authors compared results to determine consistency between interpretation of findings before compiling a final list of key findings, in an attempt to minimize bias.

Multiple content matter experts identified trauma-informed care as important when working with individuals who have experienced violence. Several experts specifically highlighted the importance of knowing the history of the local area to understand community and intergenerational trauma. To improve comfort levels of those working

with individuals who have experienced violence, the content matter expert in psychosocial OT noted the importance of improving self-awareness and expanding horizons to improve therapeutic relationships. The content matter expert in OT trauma-informed care suggested that students should have a clear understanding of OT's role in trauma, which could involve exploring concrete examples of responses to trauma within OT's scope. Content matter experts at the community agencies also emphasized the importance of crisis and safety management with this population and discussed core concepts from trainings hosted by their programs. Additionally, content matter experts emphasized the importance of collaborating with case managers and other community resources to provide the best care for individuals who have experienced violence.

Hand Surgery, Hand Therapist, and HT-SELC Student Surveys

Results from the interviews with content matter experts and literature review guided development of the healthcare provider surveys, which explored topics such as perceived needs and barriers of the UEVI population, self-rated competency addressing these needs, awareness of local resources, frequency of resource referral, and opinions on potential additional interventions with HT-SELC patients. Survey question format included Likert scales, multiple-choice and textboxes to allow for expansion on questions and provide additional feedback. Survey questions were developed through an iterative process between the three authors. Surveys were electronically distributed via Qualtrics software (Qualtrics, Provo, UT). Data was analyzed using IBM SPSS Statistics Version 24 (SPSS, Inc., Chicago, IL).

Two hand surgery physicians who refer to the HT-SELC, nine hand therapists at the OT program's hand clinic, and 12 students in the HT-SELC completed the survey. Physicians noted a large proportion of their patients have UEVI (one selected 26-50% and the other 51-75%), while most hand therapists reported that between 1-25% of their patients seen have UEVI. Half of the hand therapists rated they were somewhat competent working with individuals with UEVI. All hand therapists agreed that patients with UEVI can have occupational performance interruption, psychological symptoms, grief and loss, difficulties with sleep and pain, and limited resources. Most hand therapists (78%) noted that their treatment approach is different for patients with UEVI, including more referrals to counseling services and other mental health services than the non-UEVI population. When asked about their awareness of local agencies that can help patients with UEVI, physicians reported no awareness, while 89% of hand therapists and 25% of students knew of at least one local agency.

Most of the students had treated one or more individuals with UEVI, and most felt "somewhat competent" treating this population, yet some felt "incompetent." Examples of student suggestions to improve the HT-SELC included increasing student training for working with this population by using case studies and role playing that addresses the needs of this population, and inclusion of trauma-informed care training. Students identified many barriers faced by this population, including, but not limited to concerns about finances for resources, concerns about transportation and limited social support.

Focus Groups

The main aim of the focus group was to identify treating professionals' preparedness to meet needs of survivors of violence seen in a pro-bono clinic setting. Focus group questions were created based on results from the above-described activities, to expand on survey responses, provide a faculty-free environment to share feedback regarding clinic experience and explore possible interventions and solutions to areas the student clinicians felt unprepared to address. The OT student authors reviewed survey data individually before discussing and writing the focus group questions iteratively with feedback provided from the faculty author. Focus groups were conducted by the OT student authors and were recorded and data was transcribed verbatim. Thematic analysis (Braun & Clarke, 2006) was used to guide organization of the data. While a formal qualitative data process was not completed, the two OT student authors independently identified preliminary codes before discussing key findings and summaries from the focus groups.

Three third-year students, five second-year students, and one post-professional HT-SELC student participated in in-person focus groups. Second-year students described times where they felt unsure of their communication skills, such as handling affective psychological expressions of trauma including hostility and tearfulness. The second-year students proposed solutions to increase competence and comfort, such as practicing potential interactions and learning more about the population before providing OT services. Students shared that their experiences in Psychosocial Interventions class, a class they took after they assumed student clinician duties, helped them feel more comfortable working with patients with and without UEVI. Third-year students described how immersion and practice on Level two fieldwork helped them feel more comfortable with patient interactions in general.

Examples of focus group quotes from various student clinicians include:

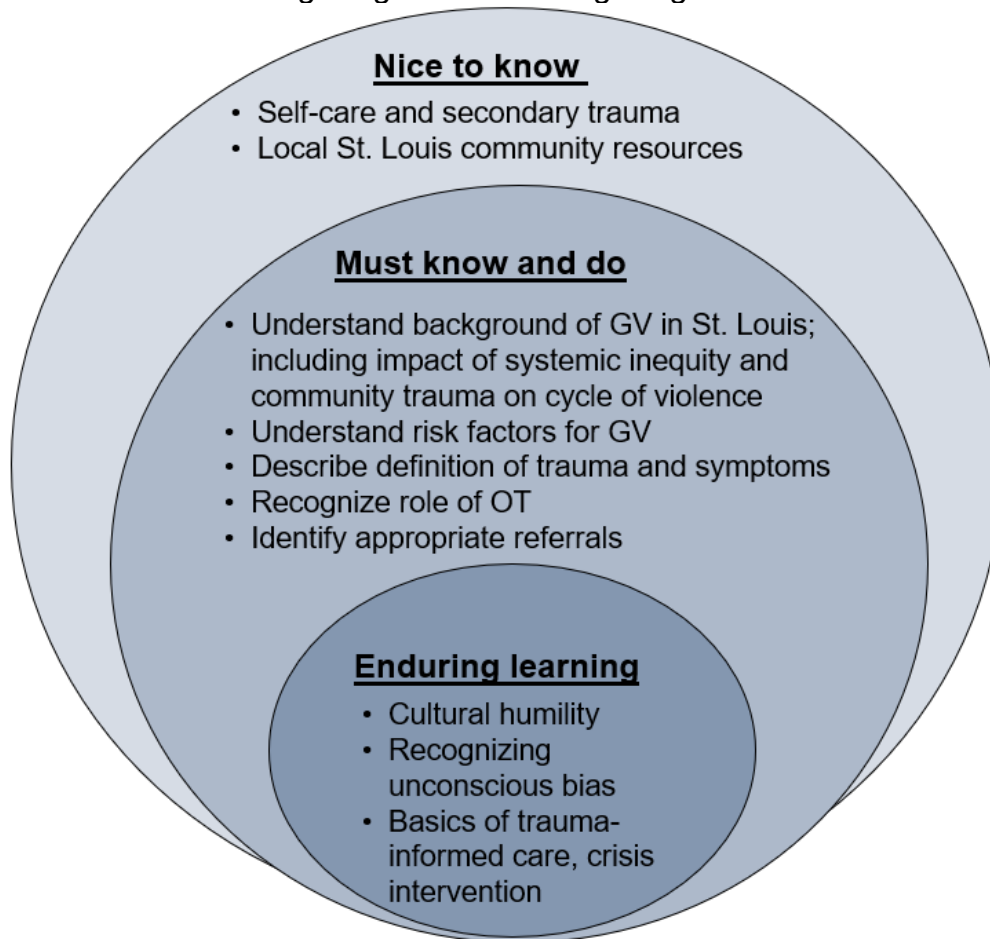
- "I think that some of us were a little caught off guard with what to say."
- "I don't think I would count myself as being extremely comfortable talking about these types of issues [related to surviving a traumatic injury]..."
- "I have no idea what it's like to be a victim of that sort of thing, so it's more just being someone who's there for them..."
- "I would have appreciated more empathy or understanding as to why a patient no-showed."
- "Now that we actually have data to prove it [the percentage of patients seen with violent injuries], if we don't take another step to add some sort of training for students, we won't be doing it justice, our clinic justice."

Key Findings Identified

The five key findings identified across all data sources included in the needs assessment are: 1) the importance of the history of health disparities within the local geographic areas, including population characteristics and patient barriers to healthcare access and engagement, 2) use of effective communication skills to build therapeutic relationships and provide patient-centered intervention to our population, 3) the need for provider awareness of resources in the local area, 4) the need to be skilled in responding to individuals who have experienced traumatic events in a sensitive manner, and 5) methods to foster connections among patients seen and create a sense of community in a student clinic.

Program Development

The most poignant finding from the needs assessment was that the student clinicians were inadequately prepared to work with the large proportion of patients in the HT-SELC who sustained their injury due to violence. The five steps in developing the program were followed as described in Figure 1. It was decided to focus specifically on individuals who experienced gun violence, as gun violence was the largest percentage of HT-SELC violence-related injuries and also is prevalent in the St. Louis community. Backward design instructional methodology (Daugherty, 2006; Wiggins & McTighe, 1998) helped target learning areas and create learning objectives. A main point of backward design is to identify priority areas of enduring learning, defined as “the important understandings that we want students to retain after they’ve forgotten many of the details” (Wiggins & McTighe, 1998). The knowledge and skills that students “must know and do” are essential prerequisites to enduring learning, with other areas that must be understood at a broader level identified as “nice to know.” Examination of the key findings from the needs assessment resulted in the levels of understanding and areas of enduring learning to be targeted in the training program (see Figure 2). Review of these levels of understanding led to development of the learning objectives targeted in the training program (see Figure 3).

Figure 2*Levels of Understanding Targeted in Training Program*

Note. GV = gun violence. Figure adapted from Wiggins & McTighe (1998)

Figure 3*Learning Objectives of Program*

1. Describe relevant person and environment factors for survivors of gun violence.
2. Identify underlying causes of community violence, including community trauma and the cycle of violence.
3. Reflect upon your beliefs and biases in order to improve self-awareness and foster therapeutic relationships.
4. Recognize effective and appropriate trauma-informed communication responses.
5. Identify situations for which referrals to outside and community resources would be appropriate.

Literature Review

Literature explored when developing the program focused on survivors of gun violence, mental health, trauma, and training for healthcare professionals. For example, “The Culture of Gun Violence” training program teaches medical students about the social and environmental factors contributing to gun violence from a public health perspective (Hamilton et al., 2014). This training includes interactive activities and critical reflection, however specific changes in knowledge and attitudes were not reported. Educational articles on domestic and interpersonal violence were explored as few studies examining medical professionals and gun violence were identified and no articles relating gun violence with OT were found at the time of the search. A systematic review on teaching healthcare students about violence against women found that interactive educational strategies yielded the best results, with practical application activities better than lectures, and sessions of longer duration more effective at changing attitudes (Sammut et al., 2019). For improving student confidence among nursing students working with pregnant women experiencing domestic violence, video clips of “authentic practice” were found to be effective in improving confidence and were helpful to students. Videos are often used in medical and health education and can be an effective way to provide examples of practical situations and develop interpersonal skills (Heath et al., 2007).

Mode of Delivery and Guiding Theory

Since students in the HT-SELC would need to complete the new training program concurrent with the other five HT-SELC training modules and other coursework in the entry-level curriculum, in-person class time was very limited. Students in the HT-SELC were accustomed to completing electronic training modules asynchronously, so the training program was developed on an electronic platform. Electronic-based delivery methods are shown to allow students to self-pace content and allow time to reflect on the implementation of knowledge (Ray & Berger, 2010).

The educational theories of transformational learning and constructivism were utilized when developing the learning activities. Transformational learning allows learners to critically reflect on assumptions that their beliefs and interpretations are based upon (Mezirow, 1991; Mezirow, 1997). Case studies were written to contextualize the training, which, when viewed through the lens of transformational learning, helps focus on the social determinants of health necessary to challenge and change beliefs and assumptions (Berg et al., 2019; Mezirow, 1997). Case-based learning is popular in medical and allied health education as it ties theory to practice with practical applications for deeper learning (McLean, 2016). Since learners come from a wide range of personal, educational, and professional backgrounds and have varying levels of knowledge, they perceive various learning situations differently. Constructivism learning theory acknowledges these differences by expecting each learner to actively construct or make their own knowledge based on their previous experiences (Bada & Olusegun, 2015). Constructivist learning theory also encourages use of graphics, videos, and other media as it helps to engage learners.

Cultural humility was used as a guiding concept throughout the learning module (Foronda et al., 2016; Tervalon & Murray-Garcia, 1998). This is defined as developing self-awareness as a lifelong process of one's own beliefs and values to build empowering relationships with individuals of all backgrounds (Foronda et al., 2016). The implicit bias framework was referenced to develop reflective activities to acknowledge implicit biases, stereotypes, and associations in health professions education (Sukhera & Watling, 2018). In order to address population characteristics and disparities impacting person and environment factors, the Person-Environment-Occupation-Performance Model (Baum et al., 2015) was used to frame case studies. Lawton's environmental press model (Lawton & Nahemow, 1973) provided the basis for contextualizing how the risk factors for gun violence within the St. Louis environment can impact patient occupational performance and how a patient's occupational performance can be strongly influenced by the demands of his or her environment.

Resultant Program

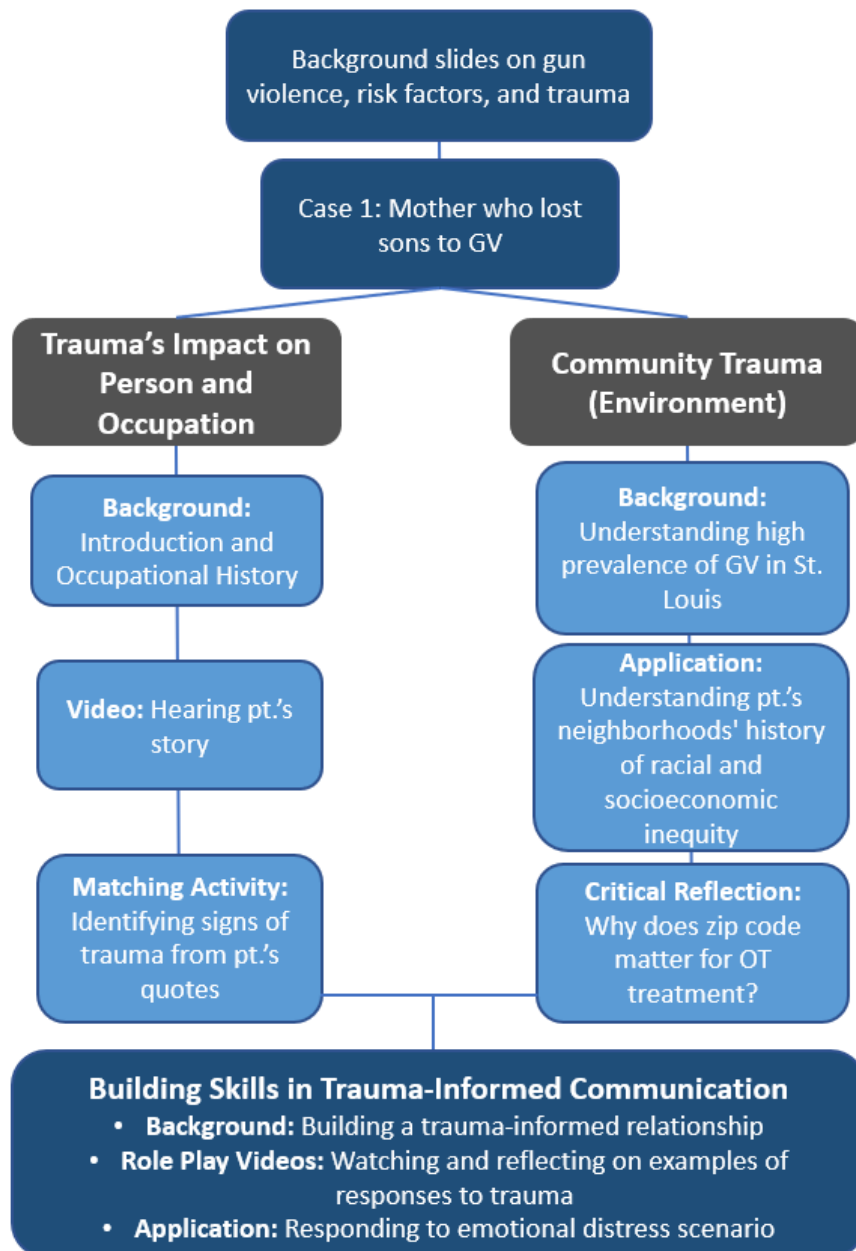
An initial draft of the program was reviewed by seven current and past student members of the HT-SELC. Feedback regarding the content, clarity, and aesthetics guided revisions, including to add more visuals and animations, decrease length of the program, and circle back to important concepts at the end of the learning. The final program was a one-hour e-learning module hosted on a secure University website. It included 85 PowerPoint slides, including title, disclaimer, content warning, and reference slides. Each slide contained recorded voiceovers to describe and supplement the information and visuals, as well as the scripts for the voiceovers in the notes section for accessibility to various learners. Content-heavy slides used animations to highlight information and were timed to appear with the voiceover. Eight critical thinking activities requiring self-reflection were interspersed throughout. Existing YouTube videos of interviews with survivors of gun violence provided real-life examples to evoke emotion and allow students to visualize stories more impactfully than if they had only read the case study, as videos can evoke emotion powerfully (Ohrt et al., 2009). Examples of good and poor trauma-informed communication were role-played by two OT students. "Choose your own response" activities were interspersed throughout to demonstrate appropriate responses to specific situations embedded in the case study. Activities such as concept matching and a search within a resource guide for St. Louis area resources were included.

Concrete examples within OT's scope of practice for communication with individuals who have experienced trauma and violence were considered a priority to include. In order to incorporate the contextual relevance of health inequities and discuss the background for risk factors of gun violence, priority areas of learning were embedded into two case studies set in St. Louis. The two OT clinician content matter experts provided feedback to help build these case study scenarios. While the case studies highlight individuals with UE injuries in the outpatient setting, the training was not designed to be specific to the hand therapy setting. The first case was a mother who has lost two sons to gun violence. This case addressed the systematic inequities

causing gun violence and how these inequities can negatively impact occupational performance, as well as principles of trauma-informed care. The second case, a young male survivor of gun violence, contained examples of responses to issues of safety, crisis intervention with suicidality and retaliatory violence, and referral options. Figure 4 demonstrates an example of learning activities included in case study 1.

Figure 4

Example Learning Activities Included in Case Study 1



Note. GV = Gun violence

Pilot Testing

Method

In order to measure change in students' knowledge and attitudes, pre- and post-training surveys were iteratively developed by two of the authors (see Table 1). Feedback on the survey was provided by one clinician staff member and one OTD student in the HT-SELC and changes were incorporated. Two items were adapted with permission from the 21-Item Knowledge, Attitude and Practice Trauma-Informed Care Tool (King et al., 2019). Knowledge questions were multiple-choice questions, while attitude questions were self-ratings on a 4-point Likert scale of strongly disagree (1) to strongly agree (4). In addition, one multiple-choice question quantified students' prior experiences working with survivors of gun violence. Three open-ended questions on the post-test inquired about main areas of learning, suggestions for improvement, and additional comments.

Table 1

Knowledge and Attitude Survey Questions Linked to Learning Objectives

Survey Questions	Learning Objectives
<i>Knowledge</i>	
What might you do or say first if a new client you think may have a history of trauma becomes upset during a session?	4
What is the primary role of the OT practitioner in providing individual OT services to clients who are survivors of gun violence?	3, 4, 5
Which of the following are risk factors of gun violence?	1, 2
For a survivor of gun violence in risk of hurting themselves, which of the following would you prioritize as a referral?	5
<i>Attitude</i>	
I have unconscious biases that impact therapeutic relationships with clients of diverse backgrounds.	3
I believe that survivors of gun violence may have trauma that should be considered by healthcare professionals.	4
I feel confident knowing how to respond if a client is planning on harming themselves or another person.	5
Trauma-informed practice is essential for working effectively with our clients and their families.	4
I have a comprehensive understanding of trauma-informed practice.	4
Gun violence that occurs in a community is the fault of individuals that reside in it.	3
Gun violence disproportionately affects marginalized groups in society.	2

Note. Refer to Figure 3 for learning objectives.

After securing IRB approval from the University, pilot testing was performed. Since under 10% of our student body is from the metropolitan St. Louis area, the training was offered to all first-year graduate OT students. Students choosing to participate reviewed the informed consent form, completed the pre-training survey, the electronic training program, and the post-training survey. Participants were given approximately one week to complete the pre-survey, training, and post-survey during Spring 2020.

Data analysis was completed using IBM SPSS Statistics Version 26 (SPSS, Inc., Chicago, IL). Counts and central tendencies were computed. Pre- and post- knowledge question responses for each participant were computed into an accuracy score. Pre- to post changes in mean accuracy for each question and attitudes were computed using the Wilcoxon signed-rank test. Open-ended comments were reviewed and grouped into similar findings.

Results

Eight first-year students consented to participate and completed the full program from pre-test to post-test (9% response rate). Four of the eight students who completed the training had no prior experience with survivors of gun violence, two had 1-2 experiences, and two had over three experiences. Six additional students completed the pre-test, but did not complete the full training program nor post-test, so their results are not included.

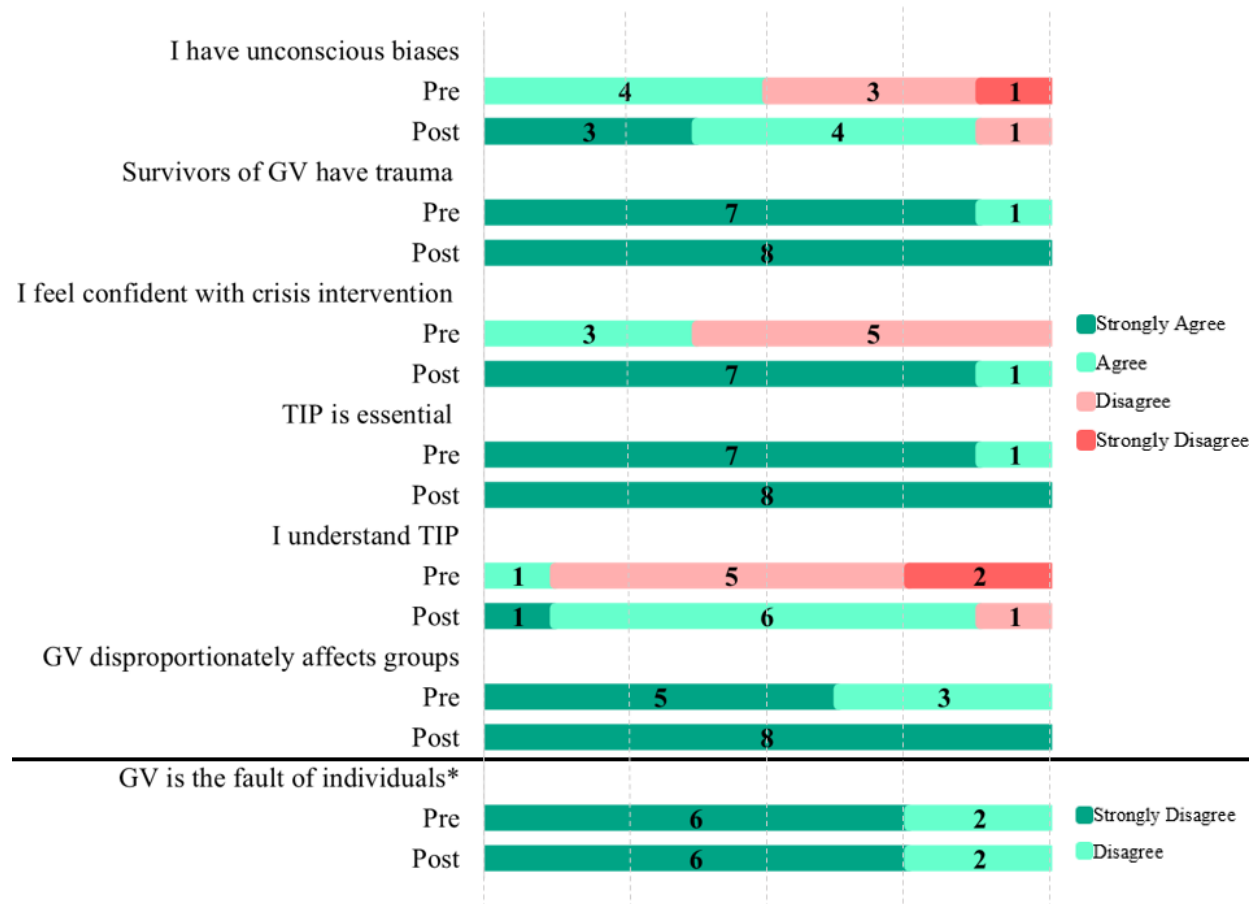
Knowledge

The mean score on the four knowledge questions was 78% correct pre-training and 97% correct post-training. Two of the knowledge questions were answered correctly by all students at pre-training. Participants' knowledge regarding referral options for a survivor of gun violence at risk of hurting themselves improved from 50% pre-training to 88% post-training. This was the only statistically significant knowledge change ($p = 0.025$). The other knowledge item that changed was identifying the primary role of OT practitioners in providing individual OT services to survivors of gun violence, although this was not significant.

Attitudes

Changes in attitudes are shown in Figure 5. The item with the most change was understanding trauma-informed practice, with 13% of students agreeing pre-training and 88% post-training. The item with the least amount of change was the statement "gun violence that occurs in a community is the fault of individuals that reside in it," with no individuals changing their response following training. It is important to note that all participants disagreed or strongly disagreed with this statement at both time points.

Three of the seven attitude items demonstrated statistically significant ($p \leq 0.05$) improvements (see Table 2). Learners increased their: 1) awareness of personal unconscious biases, 2) confidence interacting with patients with suicidal or homicidal ideation, and 3) understanding of trauma-informed practice.

Figure 5*Attitudes Pre- and Post-training for First Year Students (n = 8)*

Note. *Indicates that “disagree” is the favorable attitude for this item
 GV = gun violence, TIP = trauma-informed practice.

Table 2*Pre-Post Mean Attitude Comparison (n = 8)*

Question	Pre-Test Mean (SD)	Post-Test Mean (SD)	Change	p-value
I have unconscious biases	2.75 (.71)	3.25 (.71)	0.50*	0.046*
Survivors of GV have trauma	3.87 (.35)	4.00 (.00)	0.13	0.317
I feel confident with crisis intervention	2.38 (.52)	3.13 (.35)	0.75*	0.034*
TIP is essential	3.87 (.35)	4.00 (.00)	0.13	0.317
I understand TIP	1.87 (.64)	3.00 (.54)	1.13*	0.024*
GV is the fault of individuals	1.25 (.46)	1.25 (.46)	0.00	1.000
GV disproportionately affects groups	3.63 (.52)	4.00 (.00)	0.37	0.083

Note. Wilcoxon Signed Rank Test. *Indicates statistical significance $p \leq 0.05$; 1 (Strongly disagree) to 4 (Strongly agree); GV = gun violence, TIP = trauma-informed practice

Open-Ended Responses

All eight participants identified through free response that their main areas of learning included learning how to respond to trauma and building trauma-informed relationships. Other main areas of learning identified included knowledge acquisition of crisis intervention techniques and the role of OT with this population.

Suggestions to improve the training included:

- “Definitions for certain terms used in the presentation, such as “structural violence”
- “More videos of OT student giving possible responses to scenarios might be helpful!”

Students who responded to the optional comments question provided positive feedback as noted below:

- “Loved the diverse ways of learning: videos, quizzes, case examples, etc. This was amazingly helpful and very insightful! Thank you!”
- “As someone who had no knowledge of this material, this was extremely beneficial in introducing me to the topic.”

Discussion

This project details development and pilot testing of a well-received training program developed to meet priorities identified by a needs assessment. A strength of the program is that a multi-faceted needs assessment was performed to explore social, physical and environmental factors. Results from the needs assessment directly guided the intervention developed, as stressed in logic (Kellogg, 2004) and health promotion planning models (Glanz & Bishop, 2010). This program is innovative as it is one of the first of its kind documented that prepares OT student clinicians to address the needs of survivors of gun violence. This timely training program can help OT clinicians and educators respond to the current societal call to promote social justice and address health inequities. This program also speaks directly to AOTA’s call to maximize the health and well-being of all individuals, groups, and populations.

Theoretical underpinning, peer-reviewed literature, and teaching and learning practices were utilized when developing this program. In addition, developing cultural humility in student learners was a priority of the training. AOTA recommends that OT practitioners use cultural humility to frame working with diverse populations (Agner, 2020; AOTA, 2020b), in contrast to outdated cultural competency theories that currently dominate (AOTA 2020b; Grenier et al., 2020). For the profession to rise to the call to be inclusive and meet the needs of diverse individuals and communities, OT educators should guide students in building cultural humility through targeted activities and self-reflections, such as those included in this program.

The improvements in student participants’ ability to recognize their own unconscious biases after participating in the training is a powerful change in enduring learning that was targeted by the program. Even well-meaning, experienced healthcare practitioners demonstrate unconscious bias (Institute of Medicine Committee, 2003), which can

contribute to health disparities and negative health outcomes (Institute of Medicine Committee, 2003; Marcelin et al., 2019). Although changing beliefs, especially those central to our identities and perpetuated by stereotypes, is known to be challenging (Haines et al., 2016; Hogg & Smith, 2010; Olson, 1993), use of interactive case studies and self-reflection may have increased students' awareness of their personal biases. In addition, comments about the program indicated that the interactive learning activities were well-received by participants.

Despite being significantly underpowered to identify changes post-training, students' understanding of trauma-informed care increased. While trauma-informed care trainings in nursing and medicine are reported on (Green et al., 2015; Muskett, 2013), examples are lacking in the OT literature. Trauma-informed care has been identified as a skill necessary for future OT practitioners (Tyminski et al., 2019). All students who did not understand trauma-informed practice before the training, noted that they did after the training, demonstrating that using concrete examples of trauma-informed communication were impactful.

Content matter experts consulted in the needs assessment shared that crisis intervention training is essential for providers working with those who have experienced trauma. As a result, the HT-SELC had an ethical responsibility to prepare the student clinicians to respond to crisis situations. Although the developed training only provided introductory information, students felt more confident with crisis intervention and better equipped to choose an appropriate referral option for a crisis situation. Helping individuals impacted by gun violence access resources, such as mental health services, can facilitate healing and help break the cycle of violence (Bieler et al., 2016). As a result of the intentional and comprehensive needs assessment and backward design process, the resultant program successfully promotes the planned areas of learning, including cultural humility, unconscious bias, trauma-informed care and crisis intervention.

Limitations

The perspectives of past or current patients from the HT-SELC or other individuals who are survivors of gun violence were not gathered in the needs assessment. Although this is a limitation, the perspectives of OT clinicians with experience working with patients encountering violence and gun violence were incorporated. In addition, the findings of the needs assessment represent only the individuals who participated and the activities that were performed – there was likely bias in the development of survey and focus group questions, as these were developed and written by the student authors who were peers in the HT-SELC at the time the needs assessment was performed. For the pilot testing, the low participation rate and resultant small sample size may threaten validity, and the sample is likely not representative of the entire student body at the University or students at other OT programs. Student participants involved in pilot testing may have been more open to engage with this topic area or may have previous knowledge and favorable attitudes due to prior life experiences. In addition, the survey utilized was not psychometrically validated, although some questions were from a validated instrument.

Implications for OT Education

This learning program for OT clinicians working with survivors of gun violence addresses American Council for OT Education (ACOTE®) B standards that focus on learning about “sociocultural, socioeconomic, diversity factors, and lifestyle choices,” social determinants of health, referral to specialists and community programs, and advocacy for clients (AOTA, 2018). The broad, underlying topics covered in this training on health inequities, including systemic racism and injustices, are timely and important for OT educators (Grenier et al., 2020). This program provides an example of how to design, develop, and implement an evidence-based training or class session to respond to current issues in our communities.

Case-based learning and other strategies help create interactive learning experiences found to be effective in health professional education (McLean, 2016; Sammut et al., 2019, Thistlethwaite et al., 2012). The individual cases included in this training bring to life complex scenarios and occupational profiles with videos, pictures, and activities. This multimedia experience immerses and challenges students to think critically about people’s situations and struggles outside of their own life experiences. This project provides a concrete example of how interactive case studies can help students understand personal and contextual factors, including social determinants of health, and lead to transformational learning (Berg et al., 2019). Additionally, with the increase in online learning and dependency on educational technology due to the COVID-19 pandemic, electronic learnings like this one will be even more useful and necessary in OT student clinics and curricula.

Conclusion

By developing a training specifically for student learners working with survivors of gun violence, this project demonstrated the response of a student clinic to meet the needs of students. The teaching and learning strategies incorporated effectively address key areas of learning, such as trauma-informed care and cultural humility, which are integral for OT students and practitioners to know in order to promote inclusive practices and improve therapy outcomes. With the increasing gun violence in the U.S. and growing awareness of pre-existing health inequities and community trauma, the development and testing of this training provide many valuable insights for OT practice and education.

References

- Agner, J. (2020). The Issue Is—Moving from cultural competence to cultural humility in occupational therapy: A paradigm shift. *American Journal of Occupational Therapy*, 74, 7404347010. <https://doi.org/10.5014/ajot.2020.038067>
- American Occupational Therapy Association. (2018). 2018 Accreditation Council for Occupational Therapy Education (ACOTE®) Standards and Interpretive Guide (effective July 31, 2020). *American Journal of Occupational Therapy*, 72(Supplement 2), 1-83. <https://doi.org/10.5014/ajot.2018.72S217>
- American Occupational Therapy Association. (2020a). AOTA Statement on Justice and Systemic Racism. <https://www.aota.org/Publications-News/AOTANews/2020/AOTA-Statement-On-Systemic-Racism.aspx>

- American Occupational Therapy Association. (2020b). Occupational therapy's commitment to diversity, equity, and inclusion. *American Journal of Occupational Therapy*, 74(Suppl. 3):7413410030. <https://doi.org/10.5014/ajot.2020.74S3002>
- Anderson, L. M., Scrimshaw, S.C., Fullilove, M. T. & Fielding, J. E. (2003). The community guide's model for linking the social environment to health. *American Journal of Preventative Medicine*, 24(3 Suppl), 12-20. [https://doi.org/10.1016/s0749-3797\(02\)00652-9](https://doi.org/10.1016/s0749-3797(02)00652-9)
- Bada, S. O., & Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. *Journal of Research & Method in Education*, 5(6), 66-70.
- Baum, C. M., Christiansen, C. H., & Bass, J. D. (2015). The Person-Environment-Occupation-Performance (PEOP) model. In C. H. Christiansen, C. M. Baum, & J. D. Bass (Eds.), *Occupational therapy: Performance, participation, and well-being*. SLACK Incorporated.
- Berg, C., Philipp, R., & Taff, S. D. (2019). Critical thinking and transformational learning: Using case studies as narrative frameworks for threshold concepts. *Journal of Occupational Therapy Education*, 3(3). <https://doi.org/10.26681/jote.2019.030313>
- Bieler, S., Kijakazi, K., La Vigne, N., Vinik, N., & Overton, S. (2016). Engaging communities in reducing gun violence. Urban Institute. <https://www.urban.org/sites/default/files/publication/80061/2000760-engaging-communities-in-reducing-gun-violence-a-road-map-for-safer-communities.pdf>
- Boccellari, A., Alvidrez, J., Shumway, M., Kelly, V., Merrill, G., Gleb, M., Smart, S. & Okin, R. L. (2007). Characteristics and psychosocial needs of victims of violent crime identified at a public-sector hospital: Data from a large clinical trial. *General Hospital Psychiatry*, 29, 236-243. <https://doi.org/10.1016/j.genhosppsych.2007.01.008>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Bureau of Labor Statistics. (2019). *Economy at a glance: St. Louis, MO-IL*. United States Department of Labor. Retrieved May 10, 2019 from https://www.bls.gov/eag/eag.mo_stlouis_msa.htm
- Cambria, N., Fehler, P., Purnell, J. Q., & Schmidt, B. (2018). *Segregation in St. Louis: Dismantling the Divide*. Washington University in St. Louis. <https://cpb-us-w2.wpmucdn.com/sites.wustl.edu/dist/3/1454/files/2018/06/Segregation-in-St.-Louis-Dismantling-the-Divide-22ih4vw.pdf>
- Corbin, T., Bloom, S., Wilson, A., Rich, L. & Rich, J. (2010). Approaching the health and well-being of boys and men of color through trauma-informed practice. In C. Edley, Jr. & J. R. de Velasco (Eds.), *Changing places: How communities will improve the health of boys of color* (pp. 407-428). University of California Press.
- Daud, A. Z. C., Yau, M., Barnett, F., Judd, J., Jones, R. E., Nawawi, R. F. M. (2016). Integration of occupation-based intervention in hand injury rehabilitation: A randomized controlled trial. *Journal of Hand Therapy*, 29(1), 30-40. <https://doi.org/10.1016/j.jht.2015.09.004>
- Daugherty, K. K. (2006). Backward course design: Making the end the beginning. *American Journal of Pharmaceutical Education*, 70(6), 135. <https://doi.org/10.5688/aj7006135>

- Everytown Research & Policy. (2020). Gun Violence and COVID-19. <https://everytownresearch.org/report/gun-violence-and-covid-19-colliding-public-health-crises/>
- Foronda, C., Baptiste, D. L., Reinholdt, M. M., & Ousman, K. (2016). Cultural humility: A concept analysis. *Journal of Transcultural Nursing, 27*, 210–217. <https://doi.org/10.1177/1043659615592677>
- Fowler, K. A., Dahlberg, L. L., Haileyesus, T., & Annet, J. L. (2015). Firearm injuries in the United States. *Preventative Medicine, 79*, 5-14. <https://doi.org/10.1016/j.ympmed.2015.06.002>
- Francis, M. (2018). A narrative inquiry into the experience of being a victim of gun violence. *Journal of Trauma Nursing, 25*(6), 381-388. <https://doi.org/10.1097/JTN.0000000000000406>
- Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health, 31*, 399-418. <https://doi.org/10.1146/annurev.publhealth.012809.103604>
- Green, B. L., Saunders, P. A., Power, E., Dass-Brailsford, P., Schelbert, K. B., Giller, E., Wissow, L., Hurtado-de-Mendoza, A., & Mete, M. (2015). Trauma-informed medical care: CME communication training for primary care providers. *Family Medicine, 47*(1), 7–14.
- Grenier, M. L., Zafran, H., & Roy, L. (2020). Current landscape of teaching diversity in occupational therapy education: A scoping review. *American Journal of Occupational Therapy, 74*(6), 7406205100p1-7406205100p15. <https://doi.org/10.5014/ajot.2020.044214>
- Haines, E. L., Deaux, K., & Lofaro, N. (2016). The times they are a-changing... or are they not? A comparison of gender stereotypes, 1983-2014. *Psychology of Women Quarterly, 40*(3), 353-363. <https://doi.org/10.1177/0361684316634081>
- Hamilton, S., Neeley, S., & Roman, B. (2014). The culture of gun violence: An active learning exercise. *MedEdPortal Journal of Teaching and Learning Resources*. https://doi.org/10.15766/mep_2374-8265.9941
- Hannah, S. (2011). Psychosocial issues after a traumatic hand injury: Facilitating adjustment. *Journal of Hand Therapy, 24*, 95-103. <https://doi.org/10.1016/j.jht.2010.11.001>
- Hargarten, S. W., Lerner, E. B., Gorelick, M., Brasel, K., deRoos-Cassini, T., & Kohlbeck, S. (2018). Gun violence: A biopsychosocial disease. *Western Journal of Emergency Medicine, 19*(6), 1024–1027. <https://doi.org/10.5811/westjem.2018.7.38021>
- Heath, C., Luff, P., & Sanchez Svensson, M. (2007). Video and qualitative research: Analysing medical practice and interaction. *Medical Education, 41*(1), 109-116. <https://doi.org/10.1111/j.1365-2929.2006.02641.x>
- Hogg, M. A., & Smith, J. R. (2010). Attitudes in social context: A social identity perspective. *European Review of Social Psychology, 18*(1), 89-131. <https://doi.org/10.1080/10463280701592070>
- Institute of Medicine (US) Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care, Smedley, B. D., Stith, A. Y., & Nelson, A. R. (Eds.). (2003). *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*. National Academies Press.

- Kagawa, R. M. C., Cerda, M., Rudolph, K. E., Pear, V. A., Keyes, K. M., & Wintemute, G. J. (2018). Firearm involvement in violent victimization and mental health: An observational study. *Annals of Internal Medicine*, 169(8), 584-585.
<https://doi.org/10.7326/M18-0365>
- Kellogg. (2004). Logic Model Development Guide. W.K. Kellogg Foundation.
- King, S., Chen, K. L. D., & Chokshi, B. (2019). Becoming trauma informed: Validating a tool to assess health professional's knowledge, attitude, and practice. *Pediatric Quality & Safety*. 5, e215. <https://doi.org/10.1097/pq9.0000000000000215>
- Kuhls, D. A., Campbell, B. T., Burke, P. A., Allee, L., Hink, A., Letton, R. W., Masiakos, P. T., Coburn, M., Alvi, M., Lerer, T. J., Gaines, B. A., Nance, M. L., Schuerer, D. J. E., Palmieri, T. L., Davis, J. W., Douglas, M., Eley, J., Sutton, B., McAndrew, M. P. ... & Gaines, B. A. (2017). Survey of American College of Surgeons Committee on Trauma members on firearm injury: Consensus and opportunities. *Journal of Trauma and Acute Care Surgery*, 82(5), 877-886.
<https://doi.org/10.1097/TA.0000000000001405>
- Ladds, E., Redgrave, N., Hotton, M., and Lamyman, M. (2017). Systematic review: Predicting adverse psychological outcomes after hand trauma. *Journal of Hand Therapy*, 30(4), 407-419. <https://doi.org/10.1016/j.jht.2016.11.006>
- Langton, L., & Truman, J. (2014). Socio-emotional impact of violent crime. U.S. Department of Justice. <https://www.bjs.gov/content/pub/pdf/sivc.pdf>.
- Lartey, J. (2017). *Grasping for change on America's most violent streets: 'We must stop killing'*. <https://www.theguardian.com/world/ng-interactive/2017/jan/10/st-louis-gun-crime-missouri-natural-bridge-avenue>
- Lawton, M. P., & Nahemow, L. (1973). Ecology and the aging process. In: C. Eisoderofer & M. P. Lawton (Eds.) *Psychology of Adult Development and Aging*, (pp. 619–674). Washington, DC: American Psychological Association.
- Lynch, M. (2003). Consequences of children's exposure to community violence. *Clinical Child and Family Psychology Review*, 6(4), 265-274.
<https://doi.org/10.1023/B:CCFP.0000006293.77143.e1>
- Marcelin, J. R., Siraj, D. S., Victor, R., Kotadia, S., & Maldonado, Y. A. (2019). The impact of unconscious bias in healthcare: How to recognize and mitigate it. *The Journal of Infectious Diseases*, 220(S2), S62-S73.
<https://doi.org/10.1093/infdis/jiz214>
- McAndrew, R. & Kaskutas, V. (2020a). A logic model for planning, implementing, and evaluating a student-run free clinic. *Journal of Student-Run Clinics*, 6(1).
- McAndrew, R. & Kaskutas, V. (2020b). Use of a logic model to develop an innovative hand therapy clinic to provide experiential learning for occupational therapy students. *Journal of Occupational Therapy Education*, 4(3).
<https://doi.org/10.26681/jote.2020.040316>
- McLean, S. F. (2016). Case-based learning and its application in medical and health-care fields: A review of worldwide literature. *Journal of Medical Education and Curricular Development*, 3, JMECD.S20377.
<https://doi.org/10.4137/JMECD.S20377>
- Mezirow, J. (1991). *Transformative dimensions of adult learning*. Jossey-Bass.
- Mezirow, J. (1997). Transformative learning: Theory to practice. *New Directions for Adult and Continuing Education*, 1997(74), 5-12.

- Muskett, C. (2013). Trauma-informed care in in client mental health settings: A review of the literature, *International Journal of Mental Health Nursing*, 23(1), 51-59. <https://doi.org/10.1111/inm.12012>
- Ohr, J. H., Foster, J. M., Hutchinson, T. S., & Ieva, K. P. (2009). Using music videos to enhance empathy in counselors-in-training. *Journal of Creativity in Mental Health*, 4(4), 320-333. <https://doi.org/10.1080/15401380903372539>
- Olson, J. M. (1993). Attitudes and attitude change. *Annual Review of Psychology*, 44, 117-154. <https://doi.org/10.1146/annurev.ps.44.020193.001001>
- Patton, D., Sodhi, A., Affinati, S., Lee, J., & Crandall, M. (2019). Post-discharge needs of victims of gun violence in Chicago: A qualitative study. *Journal of Interpersonal Violence*, 34(1), 135-155. <https://doi.org/10.1177/0886260516669545>
- Pereira, C., Boyd, J. B., Olsavski, A., Gelfand, M., & Putnam, B. (2012). Outcomes of complex gunshot wounds to the hand and wrist. *Annals of Plastic Surgery*, 68(4), 374-377. <https://doi.org/10.1097/SAP.0b013e31823d2ca1>
- Qualtrics [Computer software]. (2017). Provo, UT: Qualtrics.
- Ray, K., & Berger, B. (2010) MSN challenges in healthcare education: A correlational study of outcomes using two learning techniques. *Journal for Nurses in Staff Development*, 26(2), 49-53. <https://doi.org/10.1097/NND.0b013e3181d4782c>
- Reeves, E., & Humphreys, J. C. (2018). Describing the healthcare experiences and strategies of women survivors of violence. *Journal of Clinical Nursing*, 27(5-6), 1170-1182. <https://doi.org/10.1111/jocn.14152>
- Richards, T., Garvert, D. W., McDade, E., Carlson, E., & Curtin, C. (2011). Chronic psychological and functional sequelae after emergent hand surgery. *Journal of Hand Surgery*, 36(10), 1663-1668. <https://doi.org/10.1016/j.jhsa.2011.06.028>
- Riley, C. L., Sarani, B., Sullivan, J. A., Upperman, J. S., Kane-Gill, S. L., & Bailey, H. (2015). Critical violent injury in the United States: A review and call to action. *Critical Care Medicine*, 43(11), 2460-2467. <https://doi.org/10.1097/CCM.0000000000001255>
- Sammot, D., Kuruppu, J., Hegarty, K., & Bradbury-Jones, C. (2019). Which violence against women educational strategies are effective for prequalifying health-care students?: A systematic review. *Trauma, Violence, and Abuse*, 1-20. <https://doi.org/10.1177/1524838019843198>
- Schleimer, J. P., McCort, C. D., Pear, V. A., Shev, A., Tomsich, E., Asif-Sattar, R., Buggs, S., Laqueur, H. S., & Wintemute, G. J. (2020). Firearm purchasing and firearm violence in the first months of the coronavirus pandemic in the United States (Pre-Print). *MedRxiv*. <https://doi.org/10.1101/2020.07.02.20145508>
- St. Louis Metropolitan Police Department. (2020). *Part 1 crime comparison based on UCR reporting neighborhood report* (Report: CRMO013-BY). https://www.slmtpd.org/crimestats/CRM0013-BY_202010.pdf
- St. Louis Regional Health Commission. (2003). Building a healthier St. Louis. <http://qocri3zgw3918amdk1xadm1.wpengine.netdna-cdn.com/wp-content/uploads/2013/07/Building-a-Healthier-St.-Louis-Report-on-the-Integrity-of-St.-Louis-Health-Care-Safety-Net-2003.pdf>
- St. Louis Regional Health Commission. (2012). Decade Review of Health Status. <https://www.stlrhc.org/>

- St. Louis Regional Health Commission. (2018). The impact of regionality on safety net access trends in St. Louis. http://qocri3zgw3918amdk1xadm1.wpengine.netdna-cdn.com/wp-content/uploads/2013/07/RHC-1701_Issue-Brief_FNL_REV_R1.pdf
- Sukhera, J., & Watling, C. (2018). A framework for integrating implicit bias recognition into health professions education. *Academic Medicine*, 93(1), 35-40. <https://doi.org/10.1097/ACM.0000000000001819>
- Sutherland, M., McKenney, M., & Elkbuli, A. (2020). Gun violence during COVID-19 pandemic: Paradoxical trends in New York City, Chicago, Los Angeles, and Baltimore. *American Journal of Emergency Medicine*. <https://doi.org/10.1016/j.ajem.2020.05.006>
- Tervalon, M., & Murray-Garcia, J. (1998). Cultural humility versus cultural competence: A critical distinction in defining physician training outcomes in multicultural education. *Journal of Health Care for the Poor and Underserved*, 9(2), 117-125. <https://doi.org/10.1353/hpu.2010.0233>
- Thistlethwaite, J. L., Davies, D., Ekeocha, S., Kidd, J. M., MacDougall, C., Matthews, P., Purkis, J., & Clay, D. (2012). The effectiveness of case-based learning in health professional education. A BEME systematic review. *BEME Guide No. 23, Medical Teacher*, 34(6), e421-e444, <https://doi.org/10.3109/0142159X.2012.680939>
- Tocco, I., Salini, E., & Bassetto, F. (2011). Impact of hand injury on patients: Psychosocially oriented nurse care. *International Journal of Nursing Practice*, 17(3), 275-279. <https://doi.org/10.1111/j.1440-172X.2011.01935.x>
- Tyminski, Q. P., Nguyen, A., & Taff, S. D. (2019). Proposing a metacurriculum for occupational therapy education in 2025 and beyond. *Journal of Occupational Therapy Education*, 3(4). <https://doi.org/10.26681/jote.2019.030404>
- Washington University in St. Louis and St. Louis University. (2015). For the sake of all. https://cpb-us-w2.wpmucdn.com/sites.wustl.edu/dist/3/1454/files/2018/06/FSOA_report_2-17zd1xm.pdf
- Wiggins, G., & McTighe, J. (1998). What is backward design? In G. Wiggins & J. McTighe (Eds.), *Understanding by Design*, 1, 7-19. Association for Supervision and Curriculum Development.