

Supporting Occupational Therapist in Practice: A Review of Suicide Intervention Training

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Introduction

In 2013, approximately 11.5 out of every 100,000 people died as a consequence of suicide, making suicide the 9th leading cause of death in Canada (Statistics Canada, 2017). Despite these numbers, a substantial amount healthcare professionals (HCPs) feel that their training is inadequate to appropriately address the topic of suicide (Canadian Association of Occupational therapist [CAOT], 2014). The role and scope of Occupational Therapy includes suicide prevention (COAT, 2014). Although the majority of OTs feel unprepared to address suicide in practice, an estimated 90% of Occupational Therapists (OTs) will perform an intervention addressing suicide at least once in their career (CAOT, 2014).

One approach to filling this knowledge gap is gatekeeper training (GT; Isaac et al., 2009). GT is an approach to suicide prevention which helps train “gatekeepers” — individuals frequently interacting with populations at risk for suicide — to identify and manage the risk of suicide. While GT may be a promising approach for OT, OTs still face a dilemma: what GT programs exist for HCPs and what is the evidence for the effectiveness of these programs? Here, the authors have reviewed GT programs available to HCPs and their associated evidence in order to both facilitate clinical decision making and to help clinicians select the training that is best suited to their practice.

Methods

In order to answer the question, broad search terms were generated including “suicide”, “training”, “program”, “program evaluation” and “suicide prevention” to maximize sensitivity (see **Appendix A** for PRISMA diagram). An electronic search was conducted using National Guideline Clearinghouse, Dynamed Plus, World Health Organization (WHO) best practice documents, Cochrane Library, Medline, CINAHL, EMBASE, PsycINFO, AMED, and AgeLine. A gray literature search was completed by searching the Google platform; result pages were reviewed until no new programs were identified. Identified programs were searched on Google Scholar, chosen since it has the largest database, to find research about their effectiveness for the HCP population,

Additionally, the authors contacted international suicide prevention organizations to ensure the comprehensiveness of this review. This approach allowed the authors to capture programs which may have been new and particular to a specific region. Four associations were contacted: The Mental Health Foundation (New Zealand), Suicide Prevention Australia, the American Association for Suicide Prevention, and the International Association for Suicide Prevention. Two organizations responded, the Mental Health Foundation (New Zealand) and Suicide Prevention Australia, but generated no new programs.

Finally, for all programs included in this review, the authors reviewed the individual program websites to identify research papers for the specific programs that might have been missed by the database search.

The inclusion criteria was developed based on both the question and the WHO guidelines. For inclusion, research needed to include HCPs in the population, assess programs which provided training on the assessment and management of suicide risk, and assess programs with a detailed description of goals and objectives. Research was excluded if it focused on institution-specific GT programs.

After the search, both authors reviewed the titles and abstracts of all articles (N=1680) to determine if they met inclusions criteria. Duplicates were removed and the remaining articles (N=31) were independently appraised by both researchers. The National Institute of Health Study Quality Assessment Tools were used for appraising pre-post study designs, systematic reviews, and randomized control trials (RCTs). The Critical Appraisal Skills Programme (CASP) Qualitative Research Checklist was used for appraising qualitative studies. Where discrepancies in ratings existed, both reviewers re-appraised the article and discussed until consensus was reached. Key findings were extracted and used to create both a Gatekeeper Training Inventory (GTI), cataloguing the characteristics and evidence of GT programs, and a decision making tool.

Results

Gatekeeper Training Inventory

The authors identified seven GT programs: Question, Persuade, Respond (QPR; N=9), Applied Suicide Intervention Skills Training (ASIST; N=7), STORM (N=6), Counselling Access to Lethal Means (CALM; N=2), Recognizing and Responding to Suicide Risk (RRSR; N=1), Suicide Awareness and Intervention Program (SAIP; N=1), Collaborative Assessment and Management of Suicidality (CAMS; N=5). Overall, the evidence suggests that these programs increase both the self-efficacy and knowledge of clinicians in addition to improving a clinician's skills and attitudes towards suicide risk assessment and management.

The GTI provides an overview of all programs and summarizes the evidence about their effectiveness (**Table 1**). The key outcomes from all articles (N=31) were extracted and organized in the a GTI by themes which were consistent across all programs. These themes were terms that best described the outcome of interest. The study design and appraisal results for the articles reviewed are available in the chart's reference list.

Table 1
Gatekeeper Training Inventory (GTI)

<u>Program Name</u>	<u>Overview</u>	<u>Evidence</u>
<p><u>Question, Persuade, Refer (QPR)</u></p> <p>(Online training available, more information available on the QPR institute website)</p>	<p><u>Description & Objectives:</u> QPR training was created by Paul Quinnett, PhD, in 1995. The training is provided in a multimedia format (lecture, videos, and an optional behavioural practice session). The components of QPR training are:</p> <ul style="list-style-type: none"> - How to get help for one's self and learn about preventing suicide - Common causes for suicidal behaviour and the warning signs of suicide - How to assume the gatekeeper role and help someone in crisis (Question a person about suicide, Persuade them to seeking help, and Refer the person to an appropriate resources) <p><u>Group size:</u> Between 10-35 in an in-person training session</p> <p><u>Time:</u> 1-1.5 hours 4-12 hours for professional training</p> <p><u>Cost:</u> Online gatekeeper training: \$29.95 In-person training: varies on group size and location, contact QPR for Quote Professional training courses (online or in-person): \$59-\$139 Instructor training (online or in-person): \$495-\$670</p>	<p><u>Behaviour</u></p> <ul style="list-style-type: none"> - Individuals trained in QPR identified that behavioural rehearsal enhanced learning and provided an opportunity to practice skills which increased both confidence and the likelihood of using those skills in the future [1] - Individuals trained in QPR reported increased willingness to learn more about suicide [1,2,3,4,5] - QPR trained clinicians average 2.5 referrals for suicide after one-year post training [4] <p><u>Self Efficacy and Confidence</u></p> <ul style="list-style-type: none"> - Following QPR training and at 1 year follow up, individuals reported improved self-efficacy for conducting suicide interventions compared to their pre-training selves [1,2,3,4,5] - Individuals trained in QPR reported improved confidence for conducting suicide interventions compared to those who had no training [1] - QPR training has a greater impact on non-clinical staff's self efficacy than clinical staff [3] <p><u>Knowledge</u></p> <ul style="list-style-type: none"> - Individuals trained in QPR reported increased knowledge about suicide and suicide risk factors [1,2,3] - Individuals trained in QPR demonstrated increased declarative knowledge about suicide relative to their pre-training selves, but this decreased at 1 year follow up [4] - QPR had greater impact on non-clinical staff's perceived knowledge than clinical staff [3] <p><u>Online vs In-person</u></p> <ul style="list-style-type: none"> - Web-based QPR training is as effective as in-person QPR training at improving knowledge, self-efficacy, and increasing likelihood of engaging in suicide prevention [6] - For both Web-based and in-person QPR training, knowledge, self-efficacy, and suicide intervention engagement declined at 6 months post training [6] <p><u>Academic Utility</u></p> <ul style="list-style-type: none"> - Nursing students trained in QPR demonstrated improved knowledge, skills, and abilities regarding suicide prevention (facts and warning signs about suicide, how to ask someone about suicide, how to get help, information about local resources) [7] - Social work students trained in QPR stated training helped to increase both knowledge about suicide and confidence with intervening, likelihood of practicing these newly acquired skills to connect with clients, and sharing of knowledge and skills obtained from training with peers [8] <p><u>QPR vs ASIST</u></p> <ul style="list-style-type: none"> - QPR and ASIST training improved attitudes about suicide and referral behavioural [9] - Individuals trained in ASIST were more likely to ask about suicide than those trained in QPR [9]

<p><u>Applied Suicide Intervention Skills Training (ASIST)</u></p>	<p><u>Description & Objectives</u> ASIST was initially developed in 1983. It is a workshop that uses variety of methods to provide training (large-group discussions, role-playing, and audio-visual presentations). At the end of the workshop, attendees will be able to:</p> <ul style="list-style-type: none"> - Identify individuals at risk for suicide to maximize their safety - Understand essential components of a suicide safety plan and how to implement that plan with individuals at risk - Understand how societal context, particularly attitudes and stigma surrounding suicide and suicidal ideation, influence attitudes on suicide prevention - Understand how to intervene with a person contemplating suicide - Understand how to utilize and integrate community resources to facilitate suicide prevention - Identify and understand other considerations arounds suicide prevention, such as the effect of suicide interventions on the clinician as well as how to best optimize one’s self care <p><u>Group Size:</u>10-12 people</p> <p><u>Time:</u></p> <ul style="list-style-type: none"> - 2 day workshop (7 hours/day) - ASIST trainers: a 4-day workshop using the Train-the-Trainer approach. <p><u>Cost:</u> Average cost is approximately \$250, but cost varies by location and group size. Contact LivingWorks for Quotes.</p>	<p><u>Patient Outcomes</u> - Individuals who called ASIST-trained workers at a crisis hotline reported lower suicidality, less hopelessness, and less depression compared to those not trained in ASIST [10]</p> <p><u>Behavior</u> - Individuals trained in ASIST do not demonstrate a more in-depth assessment process when compared to those who have not taken ASIST [11] - Individuals trained in ASIST demonstrated more effective interventions skills relative to their pre-training selves as well as compared to non-trained individuals [12] - A preponderance of published literature suggest that ASIST-trained individuals intervene for suicide more frequently but sometimes decrease the frequency of referral [12]</p> <p><u>Self Efficacy and Confidence</u> - Individuals who have taken ASIST report higher levels of confidence in their ability to assess and intervene with people at risk of suicide after having taken training [11, 12, 13]</p> <p><u>Knowledge</u> - Individuals who have taken ASIST demonstrated more knowledge on suicide, suicide assessment and suicide intervention [11,12,13]</p> <p><u>Attitudes</u> - Individuals who have taken ASIST are more willing to discuss suicide with clients [13]</p> <p><u>Cost-Effectiveness</u> - In California, every \$1 spent on ASIST training translates to an estimated \$1,100 dollars saved for the system through decreased health expenditure and increased income taxation [14]</p> <p><u>Trainer Fidelity</u> - On average, 2/3s of ASIST content was delivered during workshops. Fidelity was higher for information delivery rather than role play sections. Additional training did not improve adherence. Only 18% of trainers were rated as “very competent” in their delivery of the material, with competence varying most due to the trainer factors rather than other factors [15]</p> <p><u>Group Cohesion</u> - Undergraduate students who take ASIST together report greater levels of group cohesion and improved willingness to share with one another after having taken ASIST [16]</p>
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<p><u>STORM Skills Training: Suicide Prevention</u></p>	<p><u>Description & Objectives</u></p> <p>STORM Suicide Prevention Training is a modular, skills-based training program that aims to impart both knowledge and practical skills to gatekeepers. STORM training seven different modules which include:</p> <ol style="list-style-type: none"> 1. Assessment of Risk 2. Safety Planning 3. Problem Solving 4. Future Safety Planning 5. Self-Injury Mitigation: Assessment of Risk 6. Self-Injury Mitigation: Safety Planning 7. Suicide Postvention <p>Modules 1 and 2 are mandatory and can be accomplished in the course of a single day. Content can be specially directed towards individuals working with either prisoners or children if appropriate. Moreover, the training can be customized to the population receiving the training if appropriate (e.g., specific approaches from training the military).</p> <p>Content can be delivered in one-of-two ways. A Direct-to-Participant model, can be arranged in the UK. Outside of the UK, and for larger organizations, a Train-The-Trainer model is used where individuals are trained by master trainers.</p> <p><u>Group Size:</u> 6-60</p> <p><u>Time:</u> Between 1 and 3 days, depending on the number of modules includes</p> <p><u>Cost:</u> Varies, Contact STORM for Quote</p>	<p><u>Patient Outcomes</u></p> <ul style="list-style-type: none"> - Areas adopting widespread training of clinicians in STORM do not demonstrate a reduction in suicide mortality rates [17] <p><u>Behavior</u></p> <ul style="list-style-type: none"> - Individuals trained in STORM demonstrated improved problem solving, future planning, and provision of immediate support after training relative to their pre-training scores [18] - Individuals trained in STORM demonstrated no improvements in general interview skills, in attempting to remove lethal means from individuals at risk with suicide, and at combatting hopelessness relative to their pre-training selves [18] <p><u>Self-Efficacy and Confidence</u></p> <ul style="list-style-type: none"> - Individuals who have been trained in the STORM program feel more confidence when assessing and intervening with individuals who may be at risk for suicide relative to their pre-training selves [19,20,21,17] <p><u>Knowledge</u></p> <ul style="list-style-type: none"> - Individuals who have been trained in STORM have increased knowledge about suicide and suicide intervention relative to their pre-test scores [21] <p><u>Attitude</u></p> <ul style="list-style-type: none"> - Individuals who have been trained in STORM improve their willingness to engage with suicide prevention as well as increasing their belief in the efficacy of suicide intervention relative to their pre-training attitudes [20,21] <p><u>Satisfaction</u></p> <ul style="list-style-type: none"> - Individuals trained with STORM report high levels of satisfaction with the workshop [22] <p><u>Cost Effectiveness</u></p> <ul style="list-style-type: none"> - The money saved through the potential reduction in suicide attempts and suicide mortality outweighs the cost to the system of training individuals with STORM [22]
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<p>Counseling on Access to Lethal Means (CALM)</p> <p>(Online training available)</p>	<p><u>Description & Objectives:</u> Created by Elaine Frank and Mark Ciocc in 2009. The program training components are:</p> <ul style="list-style-type: none"> - Knowledge about suicide and lethal means - An introduction to firearms (and other lethal means) - Video presentation that models the counseling strategy - A presentation and discussion on conducting a counseling session, with optional role play <p>The goals of the program are to:</p> <ul style="list-style-type: none"> - Increase knowledge about the relationship between one's access to lethal means and suicide - Increase knowledge about the role of means restriction in preventing suicide. - Increase self-efficacy and skills to work with clients and their families to assess and reduce access to lethal means. <p><u>Group Size:</u> Not limited due to online medium</p> <p><u>Time:</u> 1.5 - 2 hours</p> <p><u>Cost:</u> Online: Free In person: \$750-\$1500 Train-the-Trainer version: \$3000-\$5000</p>	<p><u>Behaviour</u> - 65% of individuals trained in CALM reported counseling parents on means reduction at 2-3 months post training [23]</p> <p><u>Self-efficacy</u> - Individuals trained in CALM reported increased perception of skills for conducting lethal means counseling [23] - Individuals trained in CALM reported increased self-efficacy for conducting lethal means counseling, however, this decreased at 2-3 month follow up relative to post-training scores [23]</p> <p><u>Knowledge</u> - Individuals trained in CALM reported increased knowledge about conducting lethal means counseling</p> <p><u>Attitudes</u> - The beliefs, of individuals trained in CALM, about the effectiveness of lethal means counseling decreased at 2-3 months post training [23]</p> <p><u>CALM+QPR combined training</u> - Individuals trained in the combined program reported improved knowledge, preparedness, and self-efficacy to address suicide and counseling on access to lethal means [24] - Individuals trained in the combined program reported improved knowledge and attitudes about firearm assessment and safety counseling [24] - Following CALM training, 97% of individuals reported that training will alter their future interaction with suicidal patients and 83% reported having made this change 6 months following training [24]</p>
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<p>Recognizing & Responding to Suicide Risk: Essential Skills for Clinicians (RRSR)</p>	<p>Description & Objectives Created by the American Association of Suicidology (AAS) in partnership with New-Hampshire based Suicide Prevention Partnership (SPP). This program is based on core competencies for mental health professional to effectively assess and manage suicide risk. The RRSR's program takes on a multi-modal learning approach, including: self-paced learning, online interaction, classroom instruction, group and dyadic exercises, and post-training web-based collaborative learning and mentorship.</p> <p>The goals of the RRSR training are to increase the ability of mental health clinicians to:</p> <ul style="list-style-type: none"> - Competently conduct a suicide risk assessment - Formulate client risk for suicide - Develop treatment plan to address risk for suicidal behaviour <p>Time: 2 full days of in-person training</p> <p>Group size: Maximum 30 people</p> <p>Cost: Individual: Depends on trainer availability in the area For organization: Training Service Fee: \$1,500 per event (trainer travel and lodging) Participant Fee: \$80 per person Trainer Fee: \$3,500 Indirect Fee: 23% (covers invoicing, AAS insurance, rent, etc.) Train-the-trainer: Depends on trainer availability in the area. Contact RRSR for more detail</p>	<p>Behaviour - Individuals trained in RRSR demonstrated improved skills for assessment of acute and chronic suicide risk factors and protective factors, formulating risk, and planning a response to the level of formulated risk (assessed via detailed client vignettes) [25]</p> <p>Self-efficacy and Confidence - Individuals trained in RRSR reported improved confidence about working with clients at risk of suicide [25]</p> <p>Knowledge - Individuals trained in RRSR reported improved knowledge about suicide [25]</p> <p>Attitudes - Individuals trained in RRSR reported positive attitudes towards suicide prevention which continued to improve 4 months post training [25] - Following training, the perception of suicide safety plans as an alternative to no-suicide contracts improved [25] - Individuals trained in RRSR reported integrating the skills they learned during training to clinical practice by 6 month follow up [25]</p>
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<p>Suicide Awareness and Intervention Program (SAIP)</p>	<p>Description & Objectives SAIP training was adapted from the Community Response to Eliminate Suicide (CORES) training, a rural suicide awareness and intervention program, for use in an University setting. SAIP is a multi-modal training approach that uses lecture, theory (river, dam, tunnels), and videos. The training goals are:</p> <ul style="list-style-type: none"> - Increase knowledge about suicide and its signs and indicators - Introduce a model/theory to understand and explain suicidal ideation and behaviour - Increase knowledge and practice in suicide risk assessment - Increase awareness of community resources and services for referral - Increase application of knowledge and skills through scenarios and role play <p>Time: 1-day</p> <p>Group size: 10-15 people</p> <p>Cost: \$90-120\$ (plus travelling and accommodation costs outside of Tasmania)</p>	<p>Academic Utility</p> <ul style="list-style-type: none"> - Paramedicine, Medicine, and Pharmacy students trained in SAIP reported improved knowledge about suicide [26] - Paramedicine, Medicine, and Pharmacy students trained in SAIP reported improved comfort and confidence in discussing suicide with family members, friends, colleagues, and strangers [26] - Paramedicine, Medicine, and Pharmacy students trained in SAIP reported improved awareness of community supports and services available [26] - 6 months post SAIP training, students reported using the skills learned in the workshop to help themselves, provide peer support, and/or provide support to clients and colleagues on clinical placements [26]
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<p>Collaborative Assessment and Management of Suicidality (CAMS)</p>	<p>Description & Objectives CAMS is a specific, suicide-prevention intervention whose training consists of a series of online videos. Individuals who have completed the video series can request a CAMS trainer to guide a group of participants through a series of role-play scenarios over the course of a single day. Finally, individuals who have completed one or both of the aforementioned training can call an experienced CAMS clinician who will provide advice and clarification.</p> <p>The CAMS approach emphasized an empathetic, client centered perspective and seeks to have the provider understand the client's perspective. It seeks to specifically include a patient or client in developing their treatment plan. It has four components which include:</p> <ol style="list-style-type: none"> 1) Suicide Assessment 2) Suicide Specific Treatment Planning 3) Ongoing Suicide Risk Assessment 4) Producing definite clinical outcomes. <p>Cost Online Training Videos: \$99 Online Training and CEU Credit: \$135 Role Play: Cost Varies</p>	<p>Patient Outcomes</p> <ul style="list-style-type: none"> - Greater improvement in suicidal ideation and suicidal cognition at discharge compared to patients receiving treatment as usual. [27,28] - Reduction in five suicide factors: psychological pain, stress, agitation, hopelessness, and self-hate [29] -Patients reported higher levels of satisfaction after being treated using CAMS as opposed to treatment as usual [30] -Patients being treated with CAMS are more likely to continue with treatment until completion compared to the treatment as usual condition [30] -Patients being treated with CAMS have lower levels of suicidality, lower levels of patient distress, and higher levels of hope compared to the treatment as usual condition [30] <p>Online versus In-Person</p> <ul style="list-style-type: none"> -Individuals taking both in-person training and online training demonstrated high levels of satisfaction with their training [31]
<p>References for the GTI:</p> <ol style="list-style-type: none"> 1. Matthieu, M. M., & Swensen, A. B. (2014). Suicide prevention training program for gatekeepers working in community hospice settings. <i>Journal of social work in end-of-life & palliative care</i>, 10(1), 95-105. [Pre-post study design Fair quality] 2. Cerel, J., Padgett, J. H., Robbins, V., & Kaminer, B. (2012). A state's approach to suicide prevention awareness: Gatekeeper training in Kentucky. <i>Journal of evidence-based social work</i>, 9(3), 283-292. [Pre-post study design; Fair quality] 3. Matthieu, M. M., Cross, W., Batres, A. R., Flora, C. M., & Knox, K. L. (2008). Evaluation of gatekeeper training for suicide prevention in veterans. <i>Archives of Suicide Research</i>, 12(2), 148-154. [Pre-post study design; Fair quality] 4. Matthieu, M. M., Chen, Y., Schohn, M., Lantinga, L. J., & Knox, K. L. (2009). Educational preferences and outcomes from suicide prevention training in the Veterans Health Administration: One-year follow-up with healthcare employees in Upstate New York. <i>Military medicine</i>, 174(11), 1123. [Pre-post study design; Fair quality] 5. Matthieu, M., & Hensley, M. (2013). Gatekeeper training outcomes: enhancing the capacity of staff in substance abuse treatment programs to prevent suicide in a high risk population. <i>Mental Health and Substance Use</i>, 6(4), 274-286. [Pre-post study design; Fair quality] 6. Lancaster, P. G., Moore, J. T., Putter, S. E., Chen, P. Y., Cigularov, K. P., Baker, A., & Quinnett, P. (2014). Feasibility of a web-based gatekeeper training: Implications for suicide prevention. <i>Suicide and life-threatening behavior</i>, 44(5), 510-523. [Pre-post control study design; Fair quality] 		

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Clinical Decision Making Tool

The clinical decision making tool (**Figure 1**) was created by identifying the key differences between the programs and organizing them in a Person, Environment, Occupation framework (Law et al., 1996). The person category denotes factors and preferences of clinicians that need to be considered when deciding on the training program. Environment factors consider the training environment, availability of the program in the region, and the institutional environment the clinician is situated in. Finally, the occupation components are specifically related to the GT training, such as the approach to suicide prevention, length of training, etc.

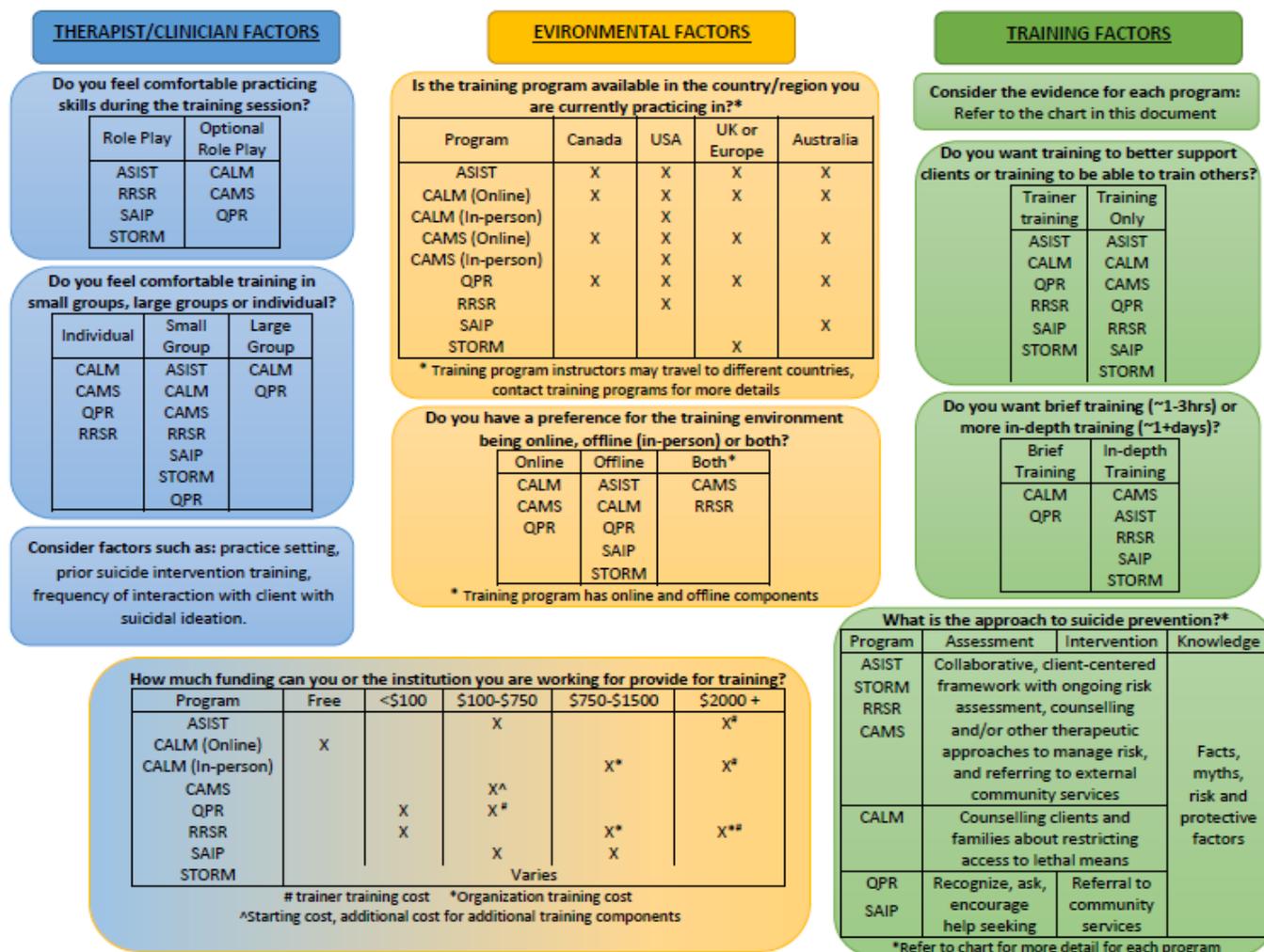


Figure 1. Clinical decision making tool designed using the Person, Environment, Occupation framework (Law et al., 1996).

Discussion

Here the authors have systematically reviewed the literature on suicide prevention gatekeeper programs, synthesized the results, and generated a clinical decision making tool. Presently, the literature reveals no clear, “best” answer as to which program will be the most effective at addressing suicidal ideation. Both individual clinicians or managers looking to implement widespread suicide prevention training will need to make a decision based upon the context of their practice, the availability of resources, and their unique learning needs.

In addition to the general overview of suicide prevention for Canadian clinicians, the authors specifically considered two populations: northern, rural or remote clinicians and educational coordinators looking to train Occupation Therapy students in suicide prevention.

Canada’s northern, rural and remote (NRR) OTs face additional challenge. OTs in these practices may find their choices especially constricted due to limited resources and isolation. NRR therapists may gravitate towards courses which can be taken online (QPR, CALM and CAMS) or courses whose training is widely available in Canada (QPR or ASIST). CALM, which focuses on removing potential lethal methods of suicide, may be especially relevant in rural or remote areas. Courses which are typically run outside of Canada (thus requiring large travel fees for training) and have no online training may be less suited to NRR practitioners.

Currently, within the Canadian OT education curriculum, there is limited consistency in preparing entry level students to address suicide in practice (L, Shimmell, personal communication, May 31, 2017). The two training programs currently used are QPR and SafeTALK (L, Shimmell, personal communication, May 31, 2017). This review identifies that there is literature supporting the use of QPR for HCP students, however, no research was identified for SafeTALK. For this population, brief GT programs (CALM, SAIP & QPR) are suited to fill the initial learning gap student may have. This allows students to gain knowledge, self-efficacy, and skills about suicide prevention to help them feel better prepared for Clinical Practicum.

Overall, the current state of the literature has a number of limitations. Most of the research currently utilizes weaker study designs, such as quasi-experimental pre-post studies. These types of approaches, while convenient, are problematic as they do not effectively establish causation. Future research should focus on using higher level study designs, particularly RCTs, to better establish the effectiveness of these programs.

Aside from issues with study design, many of the studies also contained numerous methodological flaws. The studies had small sample sizes and did not control for previous suicide prevention training. Most studies did not contain long-term follow up research leaving the long-term maintenance of training effects unknown. With studies using a pre-post design, no study took multiple measurements before the intervention was applied and no study performed

more than two follow up measures after the intervention was applied. Overall, these broad trends within the literature resulted in the author's appraising no studies as "good".

In addition to quality issues, the literature has yet to address two important topics: the effect of these programs on suicide mortality and the effectiveness of one programs versus another. In the former case, no study demonstrated that the implementation of training programs decreased suicide mortality; to the contrary, the single study examining the effect of STORM on suicide mortality found no significant difference after STORM training was widely implemented (Morriss, Gask, Webb, Dixon, & Appleby, 2005). Further research in this area will be needed to establish the effectiveness of these programs at preventing suicide.

The second issue revolves around the lack of comparative studies. Suicide prevention programs were either examined in isolation, in parallel with other programs, and in combination with other programs. The authors were unable to find research which directly compared the effectiveness of two programs. This makes choosing the most effective program, based on the literature, impossible. Further research should be performed to compare the effectiveness of these programs so as to better direct clinician choice.

The author's analysis suffered due to two main limitations. Although the authors took multiple approaches to ensure a comprehensive literature review, an additional technique not performed would have been to reference check each of the included articles. This would have been particularly relevant with ASIST where some reviews contained multiple citations not included within this analysis.

Secondly, an additional approach to ensuring the reliability of the author's appraisal would have been to calibrate the author's appraisal with that of a more experienced researcher. While the authors attempted to enhance the quality of the appraisal through independently appraising articles and reaching consensus, their inexperience may have affected the results.

Conclusion

In conclusion, the authors found seven gatekeeper training programs with evidence for their effectiveness. The literature found an abundance of low-to-fair quality evidence, typically using weaker study design, to demonstrate that these programs provided positive effects on individuals undergoing gatekeeper training. The literature currently does not demonstrate the effectiveness of these results in reducing suicide mortality, and it does not demonstrate which program is the most effective. Further research will be need to improve the quality of research and address learning gaps. Presently, clinicians and managers will need to use their clinical reasoning to determine what program best addresses their own learning needs, resource limitations, and contextual parameters.

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Appendix A

PRISMA Diagram

