

**SUICIDE ASSESSMENT AND MANAGEMENT INITIATIVE
(SAM): EVALUATING THE IMPLEMENTATION AND
UPTAKE OF SUICIDE PREVENTION ACTIVITIES IN A
HEALTHCARE SETTING**

by

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ABSTRACT

Suicide is one of the leading causes of death among Canadian men and women from adolescence to middle age and is strongly associated with mental illness. BC Mental Health and Addiction Services has developed Suicide Assessment and Management (SAM) Guidelines to identify safety risks within its client populations. Rigorous evaluation of the SAM Guidelines Initiative is essential to determine the impact of the intervention. This paper describes the literature review and logic model for the SAM Guidelines. Evaluation frameworks are discussed and the literature related to suicide prevention in healthcare settings is reviewed to inform the development of the program logic model. Stakeholder engagement and organizational context were identified as key considerations in the evaluation process.

Keywords: suicide prevention; evaluation; mental healthcare

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1: INTRODUCTION

1.1 Background and Rationale

Suicide and suicidal behaviour are important public health issues in Canada (Health Canada, 2002). In 2005, 3,742 Canadians died as a result of suicide (Statistics Canada, 2010c) representing an age-standardized mortality rate of 10.9 deaths per 100,000 population (Statistics Canada, 2010a) and 1.6% of all deaths in Canada (Statistics Canada, 2010b). In comparison, diabetes mellitus represented 3.4% of deaths and influenza and pneumonia represented 2.5% of deaths in Canada in 2005 (Statistics Canada, 2010b). Stigma surrounding suicide and difficulty in assessing the intentionality of death may create inaccuracies in mortality data; thus, the actual number of deaths attributable to suicide may be significantly higher than reported (Health Canada, 2002). Suicide is identified as one of the leading causes of death among men and women from adolescence to middle age (Health Canada, 2002).

Suicide is strongly associated with mental illness; a high proportion of individuals who commit suicide have had a history of mental illness (Health Canada, 2002). A meta-analysis by Arsenault-Lapierre, Kim and Turecki (2004) reported that of 3,275 suicide completers in Europe, North America, Australia and Asia, 87.3% had been diagnosed with a mental disorder before their death. The association between mental illness and suicide suggests the need to prioritize suicide prevention activities within populations with psychiatric disorders (Centre for Suicide Prevention, 2007).

BC Mental Health and Addiction Services (BCMHAS) is one organization with psychiatric client populations. One of the agency's key roles is to deliver specialized

mental health and addiction services including Adult Tertiary Psychiatry and Geriatric Psychiatry Services at Riverview Hospital, Forensic Psychiatric Services at the Forensic Psychiatric Hospital, and Child and Adolescent Mental Health and Addiction Services at BC Children's Hospital (BCM HAS, 2010). BCM HAS has identified suicide and self-harm as among the most important patient safety considerations in the mental health sector (BCM HAS, 2009).

The prevention of suicide and self-harm among health organizations has been prioritized, as evidenced by increasing attention to patient safety (BCM HAS, 2009) by organizations such as Accreditation Canada. Accreditation Canada is an independent, not-for-profit organization that provides external peer review to healthcare organizations to assess the quality of services (Accreditation Canada, n.d.a). By participating in programs developed by Accreditation Canada, healthcare organizations are able to compare their performance to national standards (Accreditation Canada, n.d.a). Therefore, accreditation is an effective way for healthcare agencies to continuously scrutinize and enhance their service quality (Accreditation Canada, n.d.a).

In 2004, Accreditation Canada initiated Required Organizational Practices (ROPs), essential practices that organizations must have in place in order to improve patient or client safety and to minimize risk (Accreditation Canada, n.d.b). A new ROP patient safety goal was identified in 2009 by Accreditation Canada (BCM HAS, 2009) that states that organizations are required to identify safety risks within its client population (BCM HAS, 2009). The ROP requirements are to assess, treat, and monitor all patients in contact with BCM HAS services, and to document those activities (BCM HAS, 2009). To address this ROP, BCM HAS developed Suicide Assessment & Management (SAM) Guidelines that provide an overarching structure that various sites will use to develop specific protocols to meet the needs of their particular populations (BCM HAS, 2009).

The BCMHAS SAM Guidelines are a best practice/best evidence approach to implementing assessment tools, treatment, and monitoring strategies in order to reduce the risk of suicide among clients across the three BCMHAS sites (BCMHAS, 2009). Evaluating the implementation process and success of the Guidelines is a key component of this initiative (BCMHAS, 2009).

The stated purpose of the evaluation will be to:

1. Assess the implementation and uptake of the suicide risk management ROP across BCMHAS services
2. Assess the degree to which the initiative achieved its project goal: to identify safety risks inherent in the client population as defined by Accreditation Canada's tests for compliance; and education goal: to provide staff with the appropriate training to meet project objectives

(BCMHAS, 2009)

The BCMHAS Department of Quality, Safety and Performance Improvement are conducting the evaluation. Initially, my role within this project was to develop an evaluation framework for the SAM Guidelines in collaboration with the Project Lead Dr. Tristin Wayte. My role evolved from the original task of developing a complete evaluation framework to developing a segment of the framework. My new task was to i) review the literature related to suicide prevention/risk management initiatives in healthcare settings to inform the development of evaluation methods and the selection of appropriate indicators and ii) develop a logic model for the initiative. Therefore, in the following sections, I review the literature related to suicide risk management program evaluations and develop a program logic model. First, evaluation theory, frameworks, and logic models are discussed.

2: THE EVALUATION OF HEALTH PROGRAMS

Evaluation is defined by the WHO as “the systematic examination and assessment of the features of an initiative and its effects, in order to produce information that can be used by those who have an interest in its improvement or effectiveness” (Green & South, 2006, p. 12). The evaluation of health programs began in the early 1900s and emerged out of the field of education (Issel, 2009). Guba and Lincoln (1987) describe the history of evaluation through the use of “generations,” characterized by distinct milestones (Issel, 2009, p.6). The history of evaluation provides insight into the current field of practice. The first generation of evaluation, in the early 1900s, was called “the technical generation” in which statistics and research methodology were applied to interventions (Issel, 2009, p. 6) and evaluation consisted of little more than measurement (Sarnecky, 1990). The second generation, continuing through to the 1960s, emphasized the use of goals and objectives as the foundation of evaluation (Issel, 2009). These evaluations were primarily descriptive in nature (Issel, 2009). At this stage, the utility of evaluation research was limited, in that health policy was not driven by evaluation research (Issel, 2009). The third generation involved a shift from measurement and description to “judgement” of the program's strengths and weaknesses (Laughlin & Broadbent, 1996). Lastly, the fourth generation of evaluation is referred to as the “responsive model” in which pluralism of values is acknowledged (Sarnecky, 1990) and evaluation is viewed as an interactive process centred around stakeholders (Laughlin & Broadbent, 1996). Current evaluation practice reflects components of each evaluation generation. The use of: i) systematic activities and the measurement of quantifiable outcomes, ii) goals and

objectives, iii) assessment of program strengths and weaknesses and iv) stakeholder engagement are all integral to current evaluation activities.

2.1 Evaluation Frameworks

Fink (2005) describes an evaluation framework as a guide to the evaluation, to ensure that the evaluation design acknowledges the origins and contexts of the program being evaluated. A number of public health and health promotion organizations and researchers have developed evaluation frameworks to guide evaluation work in the field (Centers for Disease Control (CDC); Health Communication Unit (HCU); Provincial Centre of Excellence for Child and Youth Mental Health (PCECYMH); Public Health Agency of Canada (PHAC); Green and South; Rootman). An examination of these public health and health promotion frameworks demonstrates common evaluation actions which are summarized below. The following steps are interdependent and while they do not represent an entirely linear process, each preceding step lays the groundwork for the following steps (CDC, 1999) creating an iterative process (Rootman, 2001). Please see Appendix A for a table of identified evaluation frameworks.

1. **Engage stakeholders:** Engaging stakeholders in the evaluation process reflects the fourth generation of evaluation (Laughlin & Broadbent, 1996) and ensures that stakeholder perspectives are acknowledged (CDC, 1999). Participatory evaluation in which stakeholders are included in all aspects of the evaluation including design, data collection and analysis may foster greater acceptance and ownership of the evaluation process and results (HCU, 2007). Stakeholder involvement in the analysis and interpretation of evaluation data may promote greater understanding of the strengths and limitations of the data (Rootman, 2001), as well as foster greater commitment to identified recommendations (CDC, 1999; Rootman, 2001; HCU, 2007; PCECYMH, 2007). Therefore,

- stakeholder participation in evaluation increases the likelihood of positive action, including program decision-making and improvement (PCECYMH, 2007).
2. **Plan the evaluation and describe the program:** Planning the evaluation can involve reviewing existing evaluation methods for similar programs (Green & South, 2006; PCECYMH, 2007) while describing the program to be evaluated includes defining the population of interest and clarifying program goals, objectives, and activities (HCU, 2007). Clear objectives are the basis for a strong evaluation plan (Green & South, 2006). One useful tool in describing public health programs is the logic model (CDC, 1999). A logic model is a visual tool that can help to describe the program's goals, objectives, activities and outcomes (CDC, 1999; Rootman, 2001; Green & South, 2006; PCECYMH, 2007; HCU 2007; PHAC, 2008). The use of logic models is discussed further in the next section.
 3. **Design the evaluation:** Designing the evaluation involves determining the evaluation methods that will be used (CDC, 1999). This includes selecting study design and sampling methods (HCU, 2007), selecting indicators to determine program success (Rootman, 2001) and designing and organizing data collection systems and tools (Green & South, 2006).
 4. **Gather, analyze, and interpret the data:** Evaluation data must be both reliable and valid in order to be high quality and useful (CDC, 1999; PCECYMH, 2007). Validity refers to the extent to which the research methods assess what they intend to assess (Green & South, 2006). Reliability refers to the repeatability of a measure (PCECYMH, 2007); that is, the extent to which the methods demonstrate the same findings under the same circumstances (Green & South, 2006). High quality data are essential to producing strong information (CDC, 1999). Secondly, analysis of the collected data allows researchers to answer the

original evaluation questions (HCU, 2007). Descriptive analysis involves describing the relationship between variables and is often used in process evaluations (PCECYMH, 2007). Inferential analysis attempts to determine whether the intervention contributed to the observed outcomes and is often used in outcome or impact evaluations (PCECYMH, 2007). Lastly, interpretation is required to determine the practical significance of the evaluation information (CDC, 1999; PCECYMH, 2007).

5. **Disseminate information and take action:** Dissemination refers to “the active, purposeful process of knowledge transfer” (Green & South, 2006, p. 148). It is recognized that knowledge alone is not sufficient to effect change in policy or practice (Green & South, 2006) yet, evaluation results must be communicated to each stakeholder group in an effective manner (CDC, 1999; HCU, 2007; PCECYMH, 2007). At the same time, knowledge transfer must consist of two-way communication (Lee & Garvin, 2003) in which knowledge is exchanged between evaluators and stakeholders. Stakeholder engagement and feedback in the interpretation process provides further validity to the evaluation findings (Green & South, 2006) and increases stakeholder commitment to action (Rootman, 2001). The development of an action plan can also facilitate the translation of evaluation results into practice (Rootman, 2001). Lastly, action based on evaluation results begins a new cycle of evaluation (Green & South, 2006); thereby integrating evaluation in the development and implementation of health programs (Rootman, 2001).

2.2 Logic Models

Logic models have been used by evaluators for more than 20 years to present a model of how a program functions under particular conditions in order to solve identified

challenges (McLaughlin & Jordan, 1999). A logic model is a diagrammatic representation of a program (Dwyer & Makin, 1997) that allows for the linkage of a program's processes to outcomes, thereby summarizing a program's mechanism of change (CDC, 1999).

According to McLaughlin and Jordan (1999), the components of a logic model are: resources, activities, outputs, customers reached, short, intermediate and longer term outcomes, and relevant external influences. However, the logic model framework is flexible and thus can take many distinct forms (Dwyer & Makin, 1997).

3: METHODS

3.1 Suicide Prevention Literature Review

The purpose of the literature review was to identify studies which evaluated suicide risk management programs in a healthcare setting. An electronic search was conducted using PsycInfo and Medline databases with key words including: patient, inpatient, or psychiatric hospital and suicide prevention and evaluation, program evaluation, or evaluation framework. Articles that reported on the outcomes of a suicide risk management program in a healthcare setting were reviewed. The reference lists of included studies were also reviewed to identify additional relevant studies.

A multitude of prevention programs have been developed in response to the important issue of suicide (Rodgers et al., 2007). However, systematic and published evaluation of suicide prevention programs is relatively scarce (Gask et al., 2006), and is especially rare within tertiary mental health settings. Where studies of similar populations and settings do not exist, the review includes literature on suicide risk management initiatives in other healthcare settings.

Eleven studies were found that evaluated process or outcome measures of a suicide risk management program implemented in healthcare settings; a group of three studies evaluated the same program, a pair of two studies evaluated a distinct program, and an additional pair of two papers report on the same study. Healthcare settings included: primary care, general hospitals, emergency departments, regional health centres, mental health services and trusts, rehabilitation and community care, psychiatric hospitals, and both inpatient and outpatient psychiatric clinics (Please see Appendix B

for study characteristics). Four studies were conducted in England, 2 in Hong Kong, 2 in Sweden and 1 each in Canada, the US, and Australia.

3.1.1 Suicide Risk Management Programs

All of the studies identified were educational programs, or included an educational component, that aimed to educate healthcare staff on the assessment, management, and treatment of suicide risk. The 11 studies included a number of common outcomes, which are organized into the following themes:

- Increased knowledge
- Improved attitudes
- Increased skills
- Increased confidence and self-efficacy
- Impact on clinical practice
- Satisfaction with training related to management of suicide risk among patients

Please see Appendix C for a summary table of the suicide risk management program outcomes and methods.

The suicide risk management programs identified have, for the most part, employed outcome measures focused on knowledge, attitudes, and skills of healthcare staff in the area of suicide risk. Evaluation of changes in organizational practice or impact on service users is less prevalent. The primary objective of suicide risk management programs is to prevent suicide, yet using suicide deaths as an outcome measure has been identified as nearly impossible due to the relative infrequency of the event (Rodger et al., 2007). Additionally, the lack of research in the area speaks to the difficulty in defining indicators to accurately evaluate suicide risk management program outcomes.

Perhaps most relevant to the BCMHAS initiative is the study by McAuliffe and Perry (2007) which implemented a best practice initiative to improve patient safety in the area of suicide prevention. The initiative included the development of a suicide risk assessment tool, staff training, and the development of clinical protocols.

McAuliffe and Perry (2007) were the only researchers to have evaluated quantitative indicators outside the realm of impact on health professionals.

These included:

- % of emergency room visits and hospital admissions
- Average length of stay for patients admitted to hospital due to suicide or self harm
- % patients assessed for suicide risk
- % patients with appropriate documentation of assessment and safety plan

3.1.2 Proposed Outcome Indicators.

From the overview of the literature, a number of outcome indicators were selected for more detailed review: Staff knowledge, attitudes, skills, confidence and self-efficacy regarding suicide risk management, the impact of the initiative on clinical care and satisfaction with training. These six indicators were selected based on high prevalence of use among the identified studies.

3.1.2.1 Knowledge

Five of the eleven studies identified above assessed the impact of the education or training program on changes in knowledge. These programs aimed to manage suicide risk by improving suicide-related knowledge in staff who care for patients at increased risk for suicide, and their families.

Chan, Chien, and Tso (2008, 2009) reported on a study which aimed to evaluate a suicide prevention and management education program delivered to general nurses in two general hospitals in Hong Kong. The program consisted of 18 hours of education and used reflective learning principles and learning methods including lectures, role-play, reflective discussions, cases studies, and self-directed study. Chan et al. (2008) reported on the qualitative data in which purposive samples were selected to participate in focus groups to evaluate outcome measures.

In focus groups conducted immediately following the training program, participants reported that the program increased their knowledge on suicidal risk factors, nurses' responsibilities in suicide prevention, and awareness of patients with suicidal intent. Additionally, nurses reported increased understanding about the psychological needs of depressed patients and their families, and families' needs for psychological support, practical help, information and communication. Focus groups were also conducted 6 months following the program to determine the program's effect on nurses' knowledge in caring for suicidal patients and their families. Participants felt the program increased their knowledge about caring for suicidal patients which led to an increase in confidence. Additionally, Chan et al. (2009) reported on a self-developed scale – the test on knowledge of management of suicide, to ascertain changes in knowledge. For this indicator, participants randomly assigned to study and control groups were assessed four times: i) before training (pretest), ii) immediately after training (posttest 1), iii) 3 months post-training (posttest 2), and iv) 6 months post-training (posttest 3). Both study and control groups demonstrated improved knowledge scores immediately following training compared to pre-test, but these scores decreased at later assessments. Thus, there was no treatment effect for this measure over the full follow-up period.

Another study included an examination of the effectiveness of training for enhancing practitioners' knowledge of suicide risks and prevention. Simpson and colleagues (2003) evaluated an education workshop that aimed to address the assessment and management of suicidality among individuals with traumatic brain injury (TBI) in Australia. The one day workshop consisted of 5.25 hours of training for professional and paraprofessional staff from a range of organizations including acute and postacute rehabilitation and long-term community care. Participants who completed the training were assessed on an objective knowledge test at three points in time: i) before training, ii) immediately following training, and iii) 6 months post-training, while a control group who did not participate in training was assessed at two points in time: i) prior to the workshop, and ii) 6 months follow up. The knowledge scale consisted of 21 dichotomous (true/false) questions addressing TBI, demographics, and clinical areas, and included a global score.

For the intervention group, there were significant increases on TBI, demographic, and global knowledge scores from pre-workshop to post-workshop, but no differences on the clinical subscale. In comparing the intervention group with the control group, there were no significant differences at pre-test but significant differences were observed for TBI, demographic, and global knowledge scores between post-workshop scores and control group scores at pre-test. At 6 months follow-up, there were significant decreases in knowledge for the workshop group on all three subscales (TBI, demographic, and clinical scales) but not on the global score. However, the workshop group scores were still significantly better than control group scores at follow-up.

In addition, a self-assessment knowledge and skills inventory was used. The scale was scored on a five-point scale and was comprised of nine items assessing knowledge. Participants demonstrated increased average self-rating scores from pre-

workshop to post-workshop in general knowledge of suicide and TBI, and also increased on the global score. No significant decreases in self-rated knowledge scores from post-workshop to follow-up were reported, nor was there significant improvement of the control group from pre-test to follow-up.

Shim and Compton (2009) completed an evaluation of a training program for emergency department personnel aimed at evaluating and treating potentially suicidal patients (including those at increased risk thereof), in the United States. The program consisted of 2 hours of didactic lectures and 1 hour of participant discussion including a description of the National Patient Safety Goals guidelines (The Basic Five-Step Evaluation – B-SAFE). To assess knowledge of the curriculum, participants completed a 16-item multiple choice scale before and immediately following the training session. A significant increase in knowledge scores was observed from pre-test to post-test.

McAuliffe and Perry (2007) report on a Best Practice Initiative in a two-site health centre to improve patient care in the area of suicide risk. The initiative included the development of strategies to implement into clinical practice in the areas of: involving patients and families in the project; comprehensive suicide risk assessment and rating scale; cost-effective staff training; and suicide assessment and risk management protocols (McAuliffe & Perry, 2007). The Best Practice Committee selected Applied Suicide Intervention Skills Training (ASIST) as the program to deliver to staff. The program's impact on staff knowledge was assessed by a self-developed scale. The results demonstrated that the percentage of staff who report that they "know what steps to take after assessing for suicide risk" increased from 87% to 97%. However, only 48% report that they "strongly agree" that they know what to do following an assessment.

A small number of studies have utilized self-assessment and objective knowledge instruments as well as qualitative methods to ascertain professionals'

knowledge of suicide risk. A review of the literature suggests that suicide prevention programs have been successful in increasing professionals' knowledge about caring for individuals at increased risk for suicide and in enhancing their knowledge about the needs of family members of suicidal individuals. However, the few studies that have included post-training follow-up evaluations suggest that there is considerable decline in gains over time suggesting a need to investigate the utility of booster sessions and refresher training.

3.1.2.2 Attitudes

Attitudes, both toward suicidal patients and toward suicide risk management training programs, were assessed in 8 of the 11 reviewed studies. Four studies assessed participants' attitudes towards caring for suicidal patients and their families, three studies assessed attitudes towards training, and one study assessed both types of attitudes.

The National Centre for Suicide Research and Prevention of Mental-III Health (NASP) introduced an educational program designed to increase suicide preventive activities among psychiatric staff. The initiative consisted of a 200-hour post-graduate educational program, delivered over 2 years in 11 psychiatric clinics in Stockholm County, Sweden (Ramberg & Wasserman, 2004b). The NASP program, based on a "training-of-trainers" model, evaluated outcomes at 5 years following the end of the program. In the evaluation, 16 participants representing 10 of the 11 clinics completed semi-structured telephone interviews in order to determine attitudes towards the course. All of the participants interviewed had positive views of the course, with the exception of one participant who expressed a wholly negative view. Participants described the course as extensive and comprehensive and reported that the program helped increase their understanding of suicidal patients and suicide prevention and helped them implement

suicide preventive programs in their clinics and in their individual work with suicidal patients.

Chan et al. (2008, 2009) used focus groups to ascertain changes in attitudes towards suicide and suicidal patients among participants. The assessment conducted immediately following training revealed that case sharing was viewed as helpful in shifting nurses' attitudes towards suicidal patients. The evaluation conducted at 6 months follow-up demonstrated that participants felt the program helped to disprove several myths about suicide which led to changes in attitudes related to suicidal patients. Additionally, Chan et al. (2009) used the Suicide Opinion Questionnaire (SOQ) for both the intervention and control groups to assess attitudes towards suicidal patients. Again, both study and control groups demonstrated improved scores on the SOQ immediately following training, or at posttest 1 for the control group, compared to pretest, but these scores decreased at later assessments. Thus, there was no treatment effect for this measure.

Three studies evaluated the Skills Training On Risk Management (STORM) program in the UK. Gask and colleagues (2006) aimed to evaluate the STORM training program in three mental health trusts in North-West England. The STORM training program was delivered by mental health nurses to front-line mental health staff in three clinical services over 6 months. A pretest-posttest design was used with participants acting as their own controls. Participants were assessed at three points in time: i) before training, ii) after training, and iii) 4 to 6 months following training. To assess attitudes towards suicide prevention, the Attitudes to Suicide Prevention Scale (ASP) was used. Changes in attitudes were entirely positive, with 10 out of 14 items on the ASP improving significantly from before training to immediately after training and seven items maintaining significant improvement at 4 months following training.

Semi-structured face-to-face interviews were also employed by Gask and colleagues (2006) to collect qualitative data on participant attitudes towards training in mental health trusts. The STORM training program was well received by participants, particularly the structured nature of the training and role-play and videotaped feedback. Nursing assistants had positive views about the training and reported increased confidence in talking with patients. Participants expressed disappointment in the lack of senior staff willingness to participate in skill demonstrations and senior staff attitudes were reported to be counterproductive.

The STORM training program was also delivered to program staff in one of three healthcare settings: primary care, accident and emergency departments, and mental health services in South Lancashire, UK (Appleby et al., 2000). This evaluation also employed the Attitudes to Suicide Prevention Scale, described above. The 14-item scale was used to assess participant attitudes towards suicide prevention both before and after completion of the training program. Overall, attitudes became less negative from pre-test to posttest; however, significant changes were only observed among accident and emergency staff who had the most negative attitudes at pretest.

Simpson and colleagues (2003) assessed participant attitudes towards suicide using a 12-item self-developed instrument scored on a four-point scale. The scale assessed three attitudinal areas: i) working with suicidal clients, ii) moral attitudes towards suicide, and iii) normality of suicide. However, the factor loadings were below the recommended minimum, so it was not feasible to use the attitude instrument as an indicator. Thus, no further analysis was completed.

Attitudes towards training were assessed within a training program in Birmingham, UK (Fenwick et al., 2004). The training program was designed to educate healthcare staff within a psychiatric teaching hospital on the assessment and detection

of suicide risk. Participants attended either a full day workshop or half-day lecture and were assessed at three points in time: i) before training, ii) immediately following training, and iii) 2 months post-training. Attitudes towards training were assessed using a self-developed scale in which participants were provided the statement, "Attending a training course can improve my ability to deal with suicidal clients" (Fenwick et al., 2004, p. 118). Participants were then asked to rate their degree of agreement with the statement on a scale of one to ten, with one representing the lowest agreement and ten representing the highest agreement: No significant difference was observed over time or between groups, indicating a lack of change on attitudes towards training.

Lastly, Shim and Compton (2009) assessed attitudes towards suicide assessment and management training for emergency department personnel using four Likert-scaled items at posttest only. Over 84% of participants who responded to the attitudinal scale rated the training as: i) very or extremely helpful, and ii) very or extremely relevant; and over 86% of respondents reported being: i) very or extremely likely to use the information in their work, and ii) very or extremely likely to recommend the training to others.

The review of the literature demonstrates that only a few of published studies have reported on the extent to which suicide risk management training programs are successful in modifying healthcare provider's attitudes, both toward suicidal patients and toward suicide risk management training programs. These studies have generally used self-developed measures; a small number of studies have also employed standardized assessment instruments and qualitative methods including focus groups and semi-structured interviews to assess attitudes towards suicide prevention. The extent to which trainees view educational programs as useful is mixed. Similarly, the effectiveness of

training in improving healthcare professionals' attitudes about suicidal patients in unclear.

3.1.2.3 Skills

Skills in caring for suicidal patients are also commonly evaluated by suicide risk management programs. Whereas “knowledge” is related to understanding and comprehension of curriculum, “skills” are conceptualized as the application of that knowledge. Eight studies evaluated participants' skills in suicide risk management.

Focus groups were used to assess participant outcomes in competence in caring for suicidal patients by Chan and colleagues (2008, 2009) following the suicide prevention and management education program for nurses in general hospitals. Participants reported that following a suicide education program they viewed themselves as more competent in assessing, communicating and helping people with suicidal intent and that the program changed their clinical practice. Chan and colleagues (2009) also reported on the assessment of participant skills using the nursing competency in suicidal prevention and management instrument at four points in time: i) before training (pretest), ii) immediately following training (posttest 1), iii) 3 months after training (posttest 2), and iv) 6 months after training (posttest 3). The study group demonstrated increased scores on the competency instrument from before training to immediately after training. Similarly, there were observed competency increases in the control group from pretest to posttest at time 1. For both groups, the increases observed from pretest to posttest at time 1 declined upon later assessments; thus, there was no treatment effect for this measure.

As discussed above, Simpson and colleagues (2003) developed a scale to assess skills in the management and assessment of suicidality among individuals with

traumatic brain injury (TBI). The self-assessment inventory consisted of 14 knowledge and skill items scored on a five-point scale, of which five items assessed skills. Participants demonstrated increased average self-rating scores from pre-workshop to post-workshop in skills for assessment/management of suicide, both generally and specific to TBI. No significant decrease in self-rated skills from post-workshop to 6 months follow-up were reported, nor was there significant improvement of the control group from pre-test to 6 months follow-up. The results suggest that participants felt that the training increased their suicide assessment/management skills; however, the study is limited due to the fact that the participants' skills were not objectively evaluated and the ratings simply reflected self-evaluations.

McAuliffe and Perry (2007) used a self-developed scale to assess the impact of the Best Practice initiative on staff's skills. Results demonstrated a 13% increase in the number of clinicians who report assessing almost all of their clients for suicide risk.

The Suicide Intervention Response Inventory Form 2 (SIRI-2) was employed in four studies to assess an individual's ability to effectively intervene with suicidal patients. Fenwick and colleagues (2004) used a pretest-posttest design, assessing participants at three points in time: i) before training, ii) immediately following training, and iii) 2 months post-training. Following training, SIRI-2 scores improved significantly, an effect that was maintained at 2 months follow-up and which was greater for participants attending the half-day lecture compared with the full-day workshop.

Morriss and colleagues (1999), Appleby and colleagues (2000), and Gask and colleagues (2006) evaluated the STORM training program discussed above and employed the SIRI-2 to assess skills in assessment and management of suicidal patients. Morriss and colleagues (1999) delivered STORM to front-line workers in four 2 hour weekly sessions, including staff from: primary care, emergency rooms in general

hospitals, social services, voluntary mental health or substance abuse agencies, and those who do not have mental health training or qualifications. Participants demonstrated significant post-training improvements, as indicated by the SIRI-2. Appleby and colleagues (2000) also assessed participants' skills both before and after the STORM training program. Forty-four percent of participants completed the SIRI-2 both before and after training; however no differences were observed between pre- and post-training scores in this study. Gask and colleagues (2006) assessed participants at three points in time: i) before training, ii) immediately after training, and iii) 4 months following training. No differences were observed on pre-training and post-training SIRI-2 scores, however, upon separate analyses, non-qualified staff and staff with no previous suicide training were found to reflect the results of the entire sample of participants including qualified healthcare professionals.

Gask and colleagues (2006) also conducted semi-structured face-to-face interviews with a purposive sample in order to ascertain the impact of the training program on participants' clinical practice. Emergent themes from these qualitative interviews suggested that the training program increased participants' confidence and as a result, changed their clinical practice. On the other hand, some respondents reported that the training program bolstered their reassurance that their current practice was satisfactory.

Lastly, to assess participant acquisition and retention of skills, videotaped role-played interviews were used by the three STORM program evaluations (Morriss et al., 1999; Appleby et al., 2000; Gask et al., 2006). Volunteer samples of participants completed ten to fifteen minute role-played interviews in which an actor played a specific patient role. Morriss and colleagues (1999) conducted the videotaped assessments both before and 1-2 months following the training program. There were no changes observed

on general interview skills, however there were significant improvements in risk assessment and management of suicidal patients at 1 month following training. Significant improvements in microskills from before training to after training were also demonstrated, including improvements in: eliciting suicidal ideas and places, adequate problem solving, and coping if the patient felt suicidal. Appleby and colleagues (2000) observed significant improvement in total scores from pretest to posttest. Mental health professionals did not improve in assessment skills, but improved in clinical management skills and total scores, albeit non-significantly. Lack of significance may be attributed to higher baseline scores of mental health professionals. On the other hand, non-mental health professionals had lower baseline scores and improved significantly in the assessment of suicidal intent and overall skills. Gask and colleagues (2006) reported non-significant increases in skills from before training to immediately after training and data were insufficient to assess whether acquired skills were maintained at 4 months following training.

Skills in caring for suicidal patients, most often the assessment and management of suicidal patients, were assessed using several methodologies. Self-assessment instruments, standardized objective instruments, video-taped role play and qualitative focus group and interview data were all used to assess changes in participants' suicide risk management skills. Overall, results suggest that skills related to suicide risk management may improve in the short term, but evidence regarding long-term maintenance of skills is lacking.

3.1.2.4 Confidence and Self-Efficacy

Confidence and self-efficacy of health professionals in caring for suicidal patients and their families was another assessment outcome. Six studies assessed confidence or self-efficacy in caring for suicidal patients and their families.

Fenwick and colleagues (2004) assessed participants on two confidence items at three points in time: i) before training, ii) immediately following training, and iii) 2 months post-training. Participants had to rank their confidence out of ten for the following statements: “I can recognize a potential suicide risk”; “I can deal with the needs of a suicidal client” (p. 118). After training there were significant improvements on both confidence questions. This effect was significantly greater for the workshop group compared with the lecture group for the second confidence question “I can deal with the needs of a suicidal client.”

McAuliffe and Perry (2007) assessed staff comfort and competence in assessing and managing suicidal patients through the use of a self-developed survey. Staff had to rank the degree to which they agree with the statement “I am provided with adequate, ongoing training in how to assess and respond to patients with suicide risk.”

The percentage of staff who report agreeing with the statement “I am provided with adequate, ongoing training in how to assess and respond to patients with suicide risk” increased from 30% to 80% with 24% of staff reporting that they “strongly agree” with the statement. Additionally, anecdotal comments indicated that suicide assessment and intervention is an area in which staff want substantial ongoing educational support.

Morriss and colleagues (1999) used a visual analogue scale to assess confidence in assessing and managing suicidal patients. The instrument is comprised of five 10-cm visual analogue scales. The five scales explore front-line workers’ confidence in:

1. “Having the interview skills to use my time well with suicidal clients”
2. “Recognising a potential suicide risk”
3. “Differentiating a mild depression from a suicide risk”
4. “Dealing with the needs of suicidal clients”

5. "Dealing with suicidal clients can be improved by attending a training course" (Morriss et al., 1999. p. 80)

Morriss and colleagues (1999) assessed participants before and after training, and reported significant improvements post-training on four out of five confidence scales.

Appleby and colleagues (2000) and Gask and colleagues (2006) used the same visual analogue scale to assess confidence, however item number five "Dealing with suicidal clients can be improved by attending a training course" was excluded. Appleby et al. (2000) found significant improvements on all confidence items from before training to after training. Similarly, Gask and colleagues (2006) observed that confidence improved significantly from before training to immediately after training, and improvements were maintained at four months post-training. Additionally, Gask and colleagues (2006) conducted semi-structured face-to-face interviews with a purposive sample of participants. Emergent themes suggested that training increased the confidence of participants, particularly among nursing assistants.

To assess self-efficacy, Shim and Compton (2009) used a 12-item, Likert-scaled instrument administered before training and immediately after training and found that participants had significantly increased self-efficacy scores from pre-test to post-test.

A second study by Ramberg and Wasserman (2004a) evaluated the same suicide prevention educational program in Stockholm County, Sweden. In this study, key individuals from 12 of the County's 23 psychiatric clinics were sent to participate in the program while the other 11 clinics served as the control group. The course consisted of a 2 hour lecture and 2 hour small group discussion, every second week for 2 years. Trainees were expected to implement suicide-preventive activities in their clinics during the second year. Self-efficacy of clinic staff (excluding individuals who participated in the program) was assessed through a questionnaire that asked whether respondents had

enough training to work with suicidal patients. Staff were assessed at two points in time: i) 6 months after the start of the course but prior to implementation of suicide-preventive activities, and ii) 1.5 years after the course ended. Among the intervention group, the proportion of participants who reported that they considered themselves sufficiently trained for work with suicidal patients increased significantly from 43% at baseline to 58% at follow-up. There were no increases in self-efficacy for staff in the control group from pretest to posttest where forty-six percent considered themselves sufficiently trained at baseline, a percentage that dropped to 42% at follow-up.

These studies suggest that the effect of suicide risk management training programs on confidence and self-efficacy have been successfully measured through the use of self-developed scales and interviews.

3.1.2.5 Impact

The impact of suicide risk management programs on clinical or organizational practice is a less prevalent but important area of assessment. Two studies assessed the impact of training programs on organizational practices or client outcomes.

Ramberg and Wasserman (2004b) assessed the impact of the NASP course on organizational practice by assessing the implementation of suicide-preventive activities in the psychiatric clinics. Through semi-structured telephone interviews conducted five years following the end of the training program, it was determined that of the 11 clinics that received the course, suicide-preventive activities were implemented in all but one. Suicide-preventive activities implemented included: training and implementation of routines such as guidelines, retrospective autopsies, suicide-risk assessment, collaboration with other clinics, and special treatment programs. Of these activities, there was variation in the components, quantity, frequency, and duration.

McAuliffe and Perry (2007) tracked quantitative measures over 4 years to assess the impact of the best practice initiative on client outcomes and organizational practices. Indicators employed by McAuliffe and Perry (2007) included: number of emergency room visits and hospital admissions with the diagnosis of suicide or self-harm; average length of stay for patients admitted due to suicide or self-harm; percentage of patients assessed for suicide risk; percentage of patients with appropriate documentation of assessment and safety plan; staff attendance at educational events related to suicide prevention (McAuliffe & Perry, 2007).

The ratio of admissions of suicidal patients presenting in the Emergency Department decreased each year from 56% prior to the project to the 2007 rate of 42%. In the first year that the initiative was implemented, there was a 14.5% reduction on average length of stay for patients admitted for suicide ideation or suicide attempt. This reduced length of stay was not maintained the following year; however a decreased utilization rate of 300 bed days per year had been maintained for 2 years due to decreased admission rates of clients presenting with suicidal ideation (McAuliffe & Perry, 2007).

Process outcomes assessed included appropriate documentation of client assessment and safety plans, accessible suicide risk management resources, and staff training. Charts were audited for safety plans, and 90% of charts contained a plan, as required. Additionally, a number of resources related to suicide risk assessment and treatment were made available including: a “cheat sheet” to remind staff of risk assessment format and to serve as a template for risk assessment format, binder and online folder containing new protocols, and other resources for suicide risk assessment. Lastly, in the first 6 months of the best practice initiative, 98% of mental health clinical and administrative staff, psychiatrists and a volunteer were trained in ASIST. ASIST

training workshops continue to be offered monthly and are attended by new mental health staff and other hospital and community members. Over the past 3 years, 90% of new staff participated in ASIST training within the first 3 months of being hired. Additionally, most staff also attended a professional development day on suicide intervention (McAuliffe & Perry, 2007).

The suicide risk management programs evaluated by Ramberg and Wasserman (2004b) and McAuliffe and Perry (2007) suggest that suicide risk management programs can effect change in client outcomes and organizational practices.

3.1.2.6 Satisfaction

Two studies assessed participant satisfaction with training, both of which employed a self-developed scale.

Appleby and colleagues (2000) employed a series of three-point scales to determine participant perceptions of usefulness of the training program with respect to specific instructional methods. Sixty-three percent of respondents reported that the skills taught were “definitely” useful and 35% of respondents reported that the skills taught were “somewhat” useful. Additionally, use of role play, group feedback, and video were viewed as very positive training methods.

Similarly, Gask and colleagues (2006) used a questionnaire to determine participant satisfaction with the training program, which focused on satisfaction with particular components of the program. Respondents reported that they enjoyed the course “definitely” (76%) or “somewhat” (23%). Participants also reported that the skills and techniques taught were useful “definitely” (79%) and “somewhat” (20%), and that group feedback sessions were useful “definitely” (76%) and “somewhat” (23%).

Feedback was very positive on specific components of the training including role-play, use of video, and content.

General satisfaction with suicide prevention training programs was successfully measured by Appleby and colleagues (2000) and Gask and colleagues (2006) using self-developed scales.

4: DISCUSSION

4.1 Limitations of the Literature

These studies highlight a number of limitations involved with evaluation research of suicide risk management programs. Limitations include: Study design, volunteer bias, generalizability, validity and reliability of indicators, program limitations such as duration and content, and period of follow-up.

Lack of randomized controlled trials or lack of randomization was cited as a limitation for a number of studies (Appleby et al., 2000; Fenwick et al., 2004; Gask et al., 2006; Morriss et al., 1999; Ramberg et al., 2004a). Thus, changes from pretest to posttest should be interpreted as preliminary evidence (Appleby et al., 2000). In the Chan and colleagues (2008, 2009) studies, both study and control groups worked in the same area, thus there may have been diffusion between the groups. Control group participants were motivated and interested in suicide risk management, thus assessments may have stimulated thinking about the subject. Lastly, the study only assessed those who were willing to participate; therefore, it is unclear whether the results will generalize to individuals who were not willing to participate in the education program.

Program duration is another common limitation in the studies published to date. Morriss and colleagues (1999) stated that their 8 hour program was likely too short to create improvements in general interview skills and the cognitive skills required to address hopelessness and self-esteem enhancement. Chan and colleagues (2009) also stated that their 8.5 hour program was likely too short to produce significant differences

between the study and control groups. Additionally, participants in the Chan and colleagues (2008, 2009) studies suggested that the duration of the program could be increased.

The generalizability, validity and reliability of the various indicators were the most common limitations cited by the suicide risk management program evaluations. Simpson and colleagues (2003) suggest that the complexity of attitudinal responses creates a challenge in assessing attitudes. Morriss and colleagues (1999) state that the use of self-assessment measures may lead to an overestimation of training effects while assessments which occurred in a role-play setting may not necessarily translate to performance in a clinical setting. Similarly, Chan and colleagues (2009) suggest that assessment of only subjective attitudes and competency rather than actual performance is a limitation of their study. Conversely, Simpson and colleagues (2003) suggest that there is a considerable role for subjective assessments of knowledge and skills in suicide risk management training programs because “in vivo” assessments, including assessment of skills through role play, although often regarded as the most valid and objective assessments of skill development, may not be representative of skills that would be used in real situations and may not be used regularly given the associated resource intensiveness. In addition, both Appleby and colleagues (2000) and Gask and colleagues (2006) state that a limitation in their assessment of program effects was that evaluation did not extend to changes in clinical or organizational practice nor impact on service users. Gask and colleagues (2006) alert organizations that confidence may increase in short-term skills training, but confidence does not always positively correlate with skills. Lastly, many studies do not use standardized measures, which disallow definitive conclusions about training effects (Appleby et al., 2000).

A final common limitation with suicide risk management training programs addresses periods of follow-up and maintenance of gains. Studies suggest that longer periods of follow-up are needed to determine the impact of the training program on clinical practice (Appleby et al., 2000; Shim & Compton, 2009). The small number of studies that did have follow-up periods longer than 4 months demonstrated significant declines in training effects (Chan et al., 2009; Simpson et al., 2003).

4.2 Recommendations from the Literature

Recommendations for future research of suicide risk management programs emerge from the limitations of these evaluation studies. The results from a number of studies indicate changes to program curricula are needed. Morriss and colleagues (1999) suggested that less emphasis should be placed on interview skills and addressing hopelessness, but should focus more on providing staff with training on emotional support, removal of lethal means, and problem solving. Similarly, Appleby and colleagues (2000) suggest an increased emphasis on assessment and management skills. Regarding future programs, Simpson and colleagues (2003) stress the importance of highlighting demographic risk factors rather than debunking suicide myths, and suggest that interviewing skills may not be an essential component for experienced professionals.

Secondly, a number of the studies suggest that increased manager or administrator participation and support in the program would be helpful (Gask et al., 2006; Chan et al., 2008). McAuliffe and Perry (2007) identify that having the training program endorsed by all levels of the Health Centre's management team was an important contributor to the success of the project.

Similarly, Gask and colleagues (2006) suggest further research on understanding the processes involved in effecting organizational change, and Ramberg and colleagues (2004b) identify a need for increased understanding of local prerequisites for successful implementation. To address challenges with implementation, continuous evaluation of implementation processes is recommended (Ramberg & Wasserman, 2004b).

To address non-attenders, Appleby and colleagues (2000) suggest several methods including extended training periods, peer dissemination and encouragement of attendance, and online learning. Shim and Compton (2009) also suggest the adaptation of training materials through various curricula formats or focus on specific geographical participants in order to improve dissemination.

Finally, several studies recommend further investigation of the duration of sustained changes, and suggest that the impact of various methods such as booster sessions, ongoing supervision, and relapse prevention plans be explored in order to enhance and maintain the gains from suicide risk management training programs (Morriss et al., 1999; Simpson et al., 2003; Chan et al., 2009)

5: RECOMMENDATIONS

The recommendations for this component of the evaluation framework take the form of information sharing. The completed literature review was presented to the Project Lead to inform the development of the SAM Guidelines evaluation methodology.

As previously described, the SAM Guidelines initiative has two distinct goals: the project goal: to identify safety risks inherent in the client population; and the education goal: to provide staff with the appropriate training to meet project objectives. From the review of suicide risk management program evaluations, six outcomes related to education and training were identified as being commonly assessed: knowledge, attitudes, skills, confidence and self-efficacy, impact, and satisfaction. These indicators were presented to the Project Lead, and of these, four outcomes: i) knowledge, ii) skills, iii) confidence, and iv) satisfaction, were selected as indicators for the BCMHAS SAM Guidelines education goal. Outcomes related to the project goal will be assessed through the Tests of Compliance determined by Accreditation Canada.

Secondly, the literature review was used to inform the development of the program logic model, but again, it was imperative that stakeholders ultimately determine program goals, activities and outcomes. Therefore, the logic model was created in collaboration with the SAM Guidelines Project Lead. The project and education goals are represented by two distinct components of the logic model. The logic model is composed of: goals, objectives, inputs, activities, outputs, short-term outcomes, and long-term outcomes. Please see Appendix D for the program logic model. The remaining evaluation methodology will be developed by the BCMHAS Quality, Safety and Performance Improvement Team.

The education component of the program logic model was derived from the review of the suicide risk management literature. The Project Lead chose to include four of the six outcome indicators reviewed: knowledge, skills, confidence, and satisfaction. Attitudes were not selected for inclusion due to the lack of evidence demonstrating attitudinal change towards suicidal patients and suicide risk management training. Although confidence and self-efficacy are often thought of interchangeably (Klassen, 2010), Bandura (1997) argues that self-efficacy refers to belief in one's capabilities whereas confidence refers simply to the strength of a belief. Given that the confidence measures identified in the suicide risk management literature refer to specific abilities, I believe the inclusion of either confidence or self-efficacy is appropriate for the SAM Guidelines Project; in this case, confidence was selected. Impact was not included in the education component of the logic model; however, impact is addressed through the objectives for the project component.

The project component of the logic model consists of five objectives, all of which were pre-determined by Accreditation Canada's Tests for Compliance. The Tests for Compliance require the use of indicators which will determine the impact of the SAM Guidelines Initiative on clinical and organizational practice. Together, the education and project components provide a comprehensive logic model to guide the evaluation of the SAM Guidelines Initiative.

6: CRITICAL REFLECTION

The underlying themes throughout my experience with this project were the importance of both stakeholder engagement and organizational context. It is well established that evaluation must address stakeholders' perspectives (Chen, 2010) evidenced by the number of evaluation frameworks which describe stakeholder engagement as an integral part of the process (CDC, 1999; HCU, 2007; PCECYMH, 2007). Chen (2010) describes the concept of viable validity, “stakeholders' views and experience regarding whether an intervention program is practical, affordable, suitable, evaluable, and helpful in the real-world” (p. 207). In the context of the BCMHAS project, stakeholders have been involved in the process of developing the Suicide Assessment and Management Guidelines. The Guidelines were developed in collaboration with a representative steering committee composed of experts, front-line clinicians, program leaders, physicians, patients and family members (BCMHAS, 2009). Secondly, sub-committees representing each implementation site are responsible for developing a site specific protocol based on the overarching Guidelines (BCMHAS, 2009). In addition, the action plans for the implementation of protocols specific to each site were developed in collaboration with Nursing and Professional Practice Leaders, Learning and Development, Planning and Strategy Development, Communications, and Risk Management Departments within BCMHAS (BCMHAS, 2009). However, it is unclear how stakeholders will be engaged in the evaluation process for this project.

In developing a program logic model, it is good practice to involve stakeholders in the process (McLaughlin & Jordan, 1999). In this project, the logic model was developed by an individual external to the organization in collaboration with the Project Lead, yet it

is unclear whether other stakeholder groups will have the opportunity to provide feedback on the logic model. As an outsider to the organization and project, I had little knowledge or influence on this process.

Another area of uncertainty related to stakeholder engagement in the evaluation process relates to the assessment of program impact on particular stakeholder groups. McAuliffe and Perry (2007) attempted to assess the impact of their best practice safety initiative on patients; therefore, the possibility of assessing BCMHAS clients was raised. Although BCMHAS clearly engaged patients and family members in the development process, patients and families will not be assessed in the evaluation. A threat to viable validity is partiality, in which the perspectives of major stakeholder groups are disregarded in the evaluation (Chen, 2010). However again as an outsider, one cannot determine whether excluding patients and families from the evaluation process constitutes a threat of partiality; rather, one must be familiar with the organizational context. Decisions regarding the evaluation process can be evidence informed, but ultimately must be determined by stakeholders.

Similarly, from this experience I have developed an appreciation for how organizational context affects the implementation of evidence-based practice in a healthcare setting. Organizational context is essential to understanding the process of change associated with implementing evidence within practice (Stetler et al., 2008). While the implementation of evidence-based practices are prolific, there is relatively little research about organizational management interventions (Stetler et al., 2008). This was echoed in the suicide risk management literature in which research regarding organizational change was identified as a gap (Gask et al., 2006; Ramberg et al., 2004b). There remains significant work to be done in understanding the impact of

organizational context on the process of translating research into practice within healthcare settings.

Through the implementation of the SAM Guidelines, BCMHAS has the opportunity to be a leader in patient safety and suicide risk management in mental healthcare settings in Canada. Through the rigorous evaluation of the SAM Guidelines, I believe BCMHAS has the opportunity to contribute not only to the research in suicide risk management in mental healthcare settings, but additionally to the body of knowledge regarding organizational implementation of evidence based practice. As a public health practitioner, this experience has allowed me to develop an appreciation for the imperative to understand the impact of organizational context on implementing best practice, developing sound evaluation, and creating change.

APPENDICES

Appendix A: Program Evaluation Frameworks

Centers for Disease Control, 1999	Rootman, 2001	Green and South, 2006	Health Communication Unit (HCU), 2007	Provincial Centre of Excellence for Child and Youth Mental Health at CHEO, 2007	Public Health Agency of Canada, 2008
1. Engage stakeholders	1. Describing the program	1. Clarifying aims and objectives	1. Clarify your program	1. Focus the evaluation; Meetings with program stakeholders	1. Focus the evaluation
2. Describe the program	2. Identifying the issues and questions	2. Choosing indicators	2. Engage stakeholders	2. Plan the evaluation	2. Select methods
3. Focus the evaluation design	3. Designing the data-collection process	3. Linking outcomes, indicators and methods	3. Assess resources	3. Prepare fieldwork; Collect and analyze data	3. Develop tools
4. Gather credible evidence	4. Collecting the data	4. Understanding context and process	4. Design the evaluation	4. Share interim findings	4. Gather and analyze data
5. Justify conclusions	5. Analyzing and interpreting the data	5. Setting up data-collection systems	5. Determine appropriate methods of measurement and procedures	5. Finalize, disseminate and discuss findings in evaluation report	5. Make decisions
6. Ensure use and share lessons learned	6. Making recommendations	6. Bringing it all together	6. Develop workplan, budget and timeline for evaluation		
	7. Dissemination		7. Collect the data using agreed-upon methods and procedures		
	8. Taking action		8. Process data and analyze the results		
			9. Interpret and disseminate results		
			10. Take action		

Appendix B: Suicide Risk Management Study Characteristics

Reference	Country	Setting	Population (N)	Program and Objectives	Program Activities	Outcomes/Indicators
Appleby, L., Morriss, R., Gask, L., et al. (2000). An educational intervention for front-line health professionals in the assessment and management of suicidal patients (The STORM Project). <i>Psychological Medicine</i> , 30, 805-812.	England	3 health care settings: (i) Primary care (ii) Accident and emergency departments (iii) Mental health services	Primary care: N=161 general practitioners; 83 practical nurses Accident and emergency departments: N=41 nursing staff, 9 junior medical staff Mental health services: N=19 junior psychiatrists; 27 community psychiatric nurses; 19 psychiatric social workers	Program: STORM (Skills Training on Risk Management) -Assessment and management of suicide risk delivered to "front-line" health staff	1. Assessment of suicide risk, mental state and psychosocial problems 2. Clinical management of suicide risk 3. Clinical management of emotional crises by 'problem solving' 4. Prevention of further crises (mental health staff only) -Emphasis of training was acquisition of risk assessment and management skills 6 hour training program for primary care and accident and emergency staff; 8 hour program for mental health staff	1. Feasibility -Rates of attendance at training 2. Impact on skills -Volunteer sample made videotapes of interviews with suicidal patients (played by actors); videotapes were made pre-training and 1-2 months post-training - <i>Suicide Intervention Response Inventory (SIRI-2)</i> : self-rated questionnaire designed to assess and mental health professional's ability to interview a patient who is distressed and/or at risk of suicide 3. Confidence, attitudes, satisfaction -Visual analogue scales to assess confidence in risk management -Attitudes scale to assess attitudes to suicide prevention -Series of 3-point scales regarding usefulness in relation to working practice and acceptability of specific teaching methods to assess satisfaction with training 4. Costs -From perspective of health and social services agencies involved in development and implementation of training e.g. costs of staff time in development of materials, training of facilitators, training of staff, costs of materials and equipment

Reference	Country	Setting	Population (N)	Program and Objectives	Program Activities	Outcomes/Indicators
Chan, S. W. C., Chien, W. T., Tso, S. (2009). Provision and evaluation of a suicide prevention and management programme by frontline nurses in Hong Kong. <i>Hong Kong Medical Journal</i> , 15, S4-8.	Hong Kong	2 general hospitals	N=110 medical nurses from medical and surgical units Study group: N=54 Control group: N=56	Education program for frontline nurses on patient suicide prevention and management	8.5 hours of learning activity -Based on reflective learning techniques	<p>1. Attitudes -<i>Suicide Opinion Questionnaire (SOQ)</i></p> <p>2. Knowledge -Test on knowledge of management of suicide</p> <p>3. Skills -Nursing competency in suicidal prevention and management</p> <p>4. Nurses' stress and coping in caring for suicidal patients</p> <p>5. Focus group interviews -Process evaluation interview conducted immediately after the program to identify program strengths and limitations -Outcome evaluation interviews conducted 6 months after the program to assess participants' competence in caring for patients with suicidal intent, and to identify factors affecting the use of knowledge in practice</p>

Reference	Country	Setting	Population (N)	Program and Objectives	Program Activities	Outcomes/Indicators
Chan, S. W., Chien, W., & Tso, S. (2008). The qualitative evaluation of a suicide prevention and management programme by general nurses. <i>Journal of Clinical Nursing</i> , 17, 2884-2894.	Hong Kong	2 regional hospitals	Nurses from medical and surgical departments Intervention group: N=54	Education program on the prevention and management of suicide for general nurses Objectives of the program: 1. To increase nurses' knowledge on suicide prevention and management for patients who have attempted suicide or are suicidal and their family members 2. To promote nurses' positive attitude towards caring for patients who have attempted suicide or are suicidal and their family members 3. To increase nurses' competence on suicide prevention and management for patients who have attempted suicide or are suicidal and their family members.	18 hour education program -Developed based on learning needs assessment	Focus groups 1. Immediately after education program for process evaluation -to identify strengths and weaknesses of the program (content, learning activities, delivery method, suggestions for improvement) 2. Six months after program for outcome evaluation -To assess participants' knowledge, attitudes, and perceived competence in caring for patients with suicide intent -To identify factors contributing or hindering their application of knowledge to practice

Reference	Country	Setting	Population (N)	Program and Objectives	Program Activities	Outcomes/Indicators
Fenwick, C. D., Vassilas, C. A., Carter, H., & Haque, M. S. (2004). Training health professional in the recognition assessment and management of suicide risk. <i>International Journal of Psychiatry in Clinical Practice</i> , 8, 117-121.	Birmingham, UK	Psychiatric teaching hospital trust	N=109 Workshop: N=88 Lecture N=21 Study population included: psychiatrists, psychiatric nurses, social workers, psychologists, occupational therapists, general practitioners, other mental health workers, and other non-mental health workers	Training in assessment and management of suicide risk Learning objectives: improved recognition of risk factors for suicide and improved ability to assess and manage clients during high-risk periods	1. Workshop -Lecture including principles of suicide assessment; small group discussion; plenary session 2. Lecture -Didactic teaching on risk assessment in suicide, group discussion and role-play	Evaluation questionnaires administered before training, immediately after and 2 months later 1. Impact of training - <i>Suicide Intervention Response Inventory</i> (SIRI-2) 2. Confidence -Two confidence in clinical management scales "I can recognize a potential suicide risk" and "I can deal with the needs of suicidal clients" (trainees rated their confidence in these statements out of 10) 3. Attitude to training -Attitude scale "Attending to a training course can improve my ability to deal with suicidal clients" (trainees rated agreement with this statement out of 10) 4. General feedback -General feedback forms asking what was most useful about the training and suggestions for improvement

Reference	Country	Setting	Population (N)	Program and Objectives	Program Activities	Outcomes/Indicators
Gask, L., Dixon, C., Morriss, L. C. R., Appleby, L., & Green, G. (2006). Evaluating STORM skills training for managing people at risk of suicide. <i>Journal of Advanced Nursing</i> , 54, 739-750.	England	3 mental health trusts	N=458 mental healthcare workers Study population included: nurses, nursing assistants, doctors, senior house officers, medical consultants, psychiatrists, occupational therapists, support workers, nursing students, social workers, administrative/support staff, clinical psychologist, art therapist 63% inpatient setting; 35% community setting; 2% both client groups	STORM (Skills Training on Risk Management) -See above (Appleby et al., 2000)	See above (Appleby et al., 2000) Training delivered by 3 mental health nurses; flexible training package usually completed in 1-2 days	<p>1. Attitudes -Rated using the <i>Attitudes to Suicide Prevention Scale</i></p> <p>2. Confidence -10 cm visual analogue scale</p> <p>3. Skills -<i>Suicide Intervention Response Inventory (SIRI 2)</i> used to assess self-rated competence in skills required for suicide crisis intervention -Videotaped role-played interviews used to assess specific skills acquisition and retention of skills over time (focus on: assessment of problems, assessment of suicide risk and immediate management)</p> <p>4. Satisfaction -Questionnaire developed to assess satisfaction with participation in training</p> <p>5. Impact -Impact on clinical practice assessed by face-to-face interview</p> <p>STORM trainers: interviewed to obtain views on the project and experiences</p>

Reference	Country	Setting	Population (N)	Program and Objectives	Program Activities	Outcomes/Indicators
McAuliffe, N., & Perry, L. (2007). Making it safer: A health centre's strategy for suicide prevention. <i>Psychiatric Quarterly</i> , 78, 295-307.	Canada	2 site health centre: general hospital, ambulatory care centre, range of outpatient and community health services	Over 400 participants trained in 2 years: 220 mental health staff, 50 staff from other areas of the hospital (i.e. Hospital switchboard operators, rehabilitation therapists), 150 staff and students from local community mental health and social service agencies	Best practice safety initiative to improve patient care in the area of suicide prevention -Provision of tools, education and training to identify and manage suicide risk	Assessment tool -Suicide risk assessment tool developed Staff training -Applied Suicide Intervention Skills Training (ASIST) Clinical protocols -Flow charts developed for each mental health program and identified different actions for different risk levels	Quantitative -% of ER visits and hospital admissions -Average length of stay for patients admitted due to suicide or self-harm -% patients assessed for suicide risk -% patients with appropriate documentation of assessment and safety plan -Staff attendance at educational events related to suicide prevention Qualitative -Staff sense of comfort and competence in assessing & managing suicidal patients -Staff satisfaction with training -Family & client perspectives on the gap between care received and care wished for
Morriss, R. Gask, L., Battersby, L., Francgheschini, A., & Robson, M. (1999) Teaching front-line health and voluntary workers to assess and manage suicidal patients. <i>Journal of Affective Disorders</i> , 52, 77-83.	UK	Front line multi-disciplinary health workers: primary care, emergency room in general hospitals, social services, voluntary agencies	N=33 front-line workers participated in training courses Study population included: 7 emergency room nurses, 3 primary care nurses, 1 family practitioner, 13 support workers, 9 substance misuse or mental health voluntary agency workers	STORM (Skills Training on Risk Management) -See above (Appleby et al., 2000)	Four 2-hour weekly sessions (8 hours total)	1. Skills -Volunteer sample made videotapes of interviews with suicidal patients (played by actors); videotapes were made pre-training and 1 month post-training - <i>Suicide Intervention Response Inventory (SIRI-2)</i> 2. Confidence -10cm visual analogue scale

Reference	Country	Setting	Population (N)	Program and Objectives	Program Activities	Outcomes/Indicators
Ramberg, I-L., & Wasserman, D. (2004a). Benefits of implementing an academic training of trainers program to promote knowledge and clarity in work with psychiatric suicidal patients. Archives of Suicide Research, 8, 331-343.	Sweden	Psychiatric clinics, inpatient and outpatient care	N=617 (65.7% response rate) Psychiatrists, psychologists, social workers, nurses, assistant nurses	NASP (Swedish National Centre for Suicide Research and Prevention of Mental Ill-Health) Objective: to promote proficiency in suicide prevention among key staff in psychiatric care	200-hour postgraduate educational program, spread over 2 years	1. Training -Training assessed by one question about whether the respondent had enough training for work with suicidal patients 2. Clarity -Measure of perceived difficulties in terms of patients' demands and lack of clarity in staff's work
Ramberg, I-L., & Wasserman, D. (2004b). Suicide-preventive activities in psychiatric care: Evaluation of an educational programme in suicide prevention. Nordic Journal of Psychiatry, 58, 389-394.	Sweden	Psychiatric clinics, inpatient and outpatient care	N=16 5 psychiatrists, 4 psychiatric social workers, 5 psychologists, 1 psychiatric assistant nurse, 1 hospital priest	NASP (Swedish National Centre for Suicide Research and Prevention of Mental Ill-Health) Objective: to promote proficiency in suicide prevention among key staff in psychiatric care	200-hour postgraduate educational program, spread over 2 years	Semi-structured telephone interview -Course participants' present working situation -Personal opinions on the course -Suicide-preventive activities -Opportunities for and obstacles to implementation of suicide-preventive activities

Reference	Country	Setting	Population (N)	Program and Objectives	Program Activities	Outcomes/Indicators
Shim, R. S., & Compton, M. T. (2009). Pilot testing and preliminary evaluation of a suicide prevention education program from emergency department personnel. <i>Community Mental Health Journal</i> , 5,	United States	Emergency Department	N=54 27 registered nurses, 13 social workers, 4 clinical nurse specialists, 10 other	Educational program designed for emergency department staff To educate emergency department personnel and enhance their attitudes, knowledge, skills, and confidence pertaining to evaluating and treating potentially suicidal patients or those at elevated risk for suicide	2 hours of didactic lecture and 1 hour of participant discussion Curriculum: presentation of National Patient Safety Goals guidelines for management of suicide attempt in ED and Basic suicide five-step evaluation protocol (B-SAFE)	Evaluation instrument was developed to measure: 1. Knowledge -16 knowledge items 2. Self-efficacy -12 self-efficacy items 3. Attitudes about curriculum -4 attitude items Evaluation instrument administered before and after training
Simpson, G., Winstanley, J., & Bertapelle, T. (2003). Suicide prevention training after traumatic brain injury. <i>Journal of Head Trauma Rehabilitation</i> , 18, 445-456.	Australia	Rehabilitation and community brain injury agencies	Intervention group N=25 (50% response rate) N=22 (78.6 response rate) Allied health, social work/psychology, case manager/disability staff, other	Traumatic Brain Injury (TBI) specific approach to suicide assessment and management	1 day (5.25 hours) workshop -Didactic presentations, small group discussion and exercises, case discussions, detailed written handouts	1. Objective knowledge test -21 dichotomous (true/false) questions 2. Knowledge/skills self-assessment inventory -14 items scored on 5-point scale 3. Attitude self-assessment inventory -12 items scored on 4-point scale

Appendix C: Suicide Risk Management Program Outcomes and Methods

Outcomes	Method / Measure	References
Knowledge	Focus groups	Chan et al., 2008 Chan et al., 2009
	Self-developed scale	Simpson et al., 2003 McAuliffe & Perry, 2007 Shim & Compton, 2009 Chan et al., 2009
Attitudes	Attitudes to Suicide Prevention Scale (ASP)	Appleby et al., 2000 Gask et al., 2006
	Focus groups	Chan et al., 2008 Chan et al., 2009
	Self-developed scale	Simpson et al., 2003 Fenwick et al., 2004 Shim & Compton, 2009
	Semi-structured interview - telephone - face-to-face	Ramberg & Wasserman, 2004b Gask et al., 2006
	Suicide Opinion Questionnaire (SOQ)	Chan et al., 2009

Outcomes	Method	References
Skills	<p>Face-to-face interviews</p> <p>Focus groups</p> <p>Self-developed scale</p> <p>Suicide Intervention Response Inventory Form 2 (SIRI-2)</p> <p>Videotaped role-played interviews</p>	<p>Gask et al., 2006</p> <p>Chan et al., 2008 Chan et al., 2009</p> <p>Simpson et al., 2003 McAuliffe & Perry, 2007 Chan et al., 2009</p> <p>Morriss et al., 1999 Appleby et al., 2000 Fenwick et al., 2004 Gask et al., 2006</p> <p>Morriss et al., 1999 Appleby et al., 2000 Gask et al., 2006</p>
Confidence and Self-efficacy	<p>Face-to-face interviews</p> <p>Self-developed scale</p> <p>Visual analogue scale</p>	<p>Gask et al., 2006</p> <p>Fenwick et al., 2004 Ramberg & Wasserman, 2004a McAuliffe & Perry, 2007 Shim & Compton, 2009</p> <p>Morriss et al., 1999 Appleby et al., 2000 Gask et al., 2006</p>

Outcomes	Method	References
Impact	Quantitative measures Semi-structured telephone interviews	McAuliffe & Perry, 2007 Ramberg & Wasserman, 2004b
Satisfaction	Self-developed scale	Appleby et al., 2000 Gask et al., 2006

Outcome	Detail	Reference
Clarity	Measurement of perceived difficulties in terms of patients' demands and lack of clarity in staff's work	Ramberg & Wasserman, 2004a
Costs	Costs of staff time to develop materials, training of facilitators, training of staff, costs of materials	Appleby et al., 2000
Course participants' present working situation	Whether participants were still working in their original clinics, had moved to another clinic, or left the jurisdiction entirely	Ramberg & Wasserman, 2004b
Feasibility	Feasibility of education program assessed by attendance rates at training	Appleby et al., 2000
General feedback	Regarding useful components of training, suggestions for improvement, identification of factors contributing to or hindering application of knowledge to practice	Fenwick et al., 2004 Ramberg & Wasserman, 2004b Chan et al., 2009
Nurses' stress and coping in caring for suicidal patients	Stress and coping among nurses in caring for suicidal patients	Chan et al., 2009

Appendix D: BCMHAS SAM Guidelines Initiative Logic Model

Project Goal	Project Objectives	Inputs (resources/ budget lines)	Activities (activities, tasks, strategies)	Outputs (deliverables)	Short-Term Outcomes	Long-Term Outcomes
Identify safety risks inherent in client population	<p>To assess each client for risk of suicide at regular intervals, or as needs change</p> <p>To identify clients at risk of suicide</p> <p>To address clients' immediate safety needs</p> <p>To identify treatment and monitoring strategies to ensure client safety</p> <p>To document treatment and monitoring strategies in client's health record</p>	<p>Planning staff resources: executive leadership, project leader, quality analyst, communications, change management & learning and development representatives, sub-committee leads/experts & members, administrative support</p> <p>Implementation staff resources: Planning staff, plus all direct care staff time</p> <p>Material resources: assessment tools</p>	<p>Development and implementation of a suicide risk management protocol for each site/population</p> <p>Communication initiative developed and implemented</p>	<p># of sites with developed and implemented protocols</p> <p>% of clients assessed for risk of suicide at intake</p> <p>% of clients assessed for risk at regular intervals, or as needs change</p> <p>% of clients with appropriate documentations of treatment strategies</p> <p>% of clients with appropriate documentations of monitoring strategies</p>	<p>Improved clinical consistency in suicide risk assessment</p> <p>Improved clinical consistency in suicide treatment strategies.</p> <p>Improved consistency of suicide monitoring strategies</p> <p>Improved consistency in documentation practices related to suicide risk management.</p>	<p>Reduction of suicide/self-harm-related safety events within BCMHAS</p>

Education Goal	Education Objectives	Inputs (resources/ budget lines)	Activities (activities, tasks, strategies)	Outputs (deliverables)	Short-Term Outcomes	Long-Term Outcomes
<p>Provide staff with the appropriate training to meet project objectives</p>	<p>To increase knowledge related to suicide risk management</p> <p>To increase skills related to suicide risk management</p> <p>To increase confidence related to suicide risk management</p> <p>To demonstrate satisfaction with suicide risk management training</p>	<p>Planning: Learning & development staff time</p> <p>Implementation: L&D staff plus all direct care staff time</p>	<p>Education initiative developed and implemented</p>	<p># of education sessions</p> <p>% of direct care staff trained</p>	<p>Increased knowledge related to suicide assessment, treatment and monitoring</p> <p>Increased skills related to suicide assessment, treatment and monitoring</p> <p>Increased confidence to assess, treat & monitor suicide risk</p> <p>Satisfaction with training related to suicide risk management</p>	<p>Reduction of suicide/self-harm-related safety events within BCMHAS</p>

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