



Intentional overdose among youth in Brant County: A literature review of community-level means restriction interventions

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Key Messages

1. Lethal means restriction is a highly effective suicide prevention intervention. Evidence has shown that educating parents of suicidal youth on means restriction significantly increases the likelihood that parents will take new action to restrict access to medications within the home, either through the use of a lock box or other safe disposal method (OR=3.6, p=0.04).
2. Descriptive studies have shown that prescribed and over-the-counter medications are readily accessible to youth in their homes and in the community, yet parents are unaware that medications pose a serious risk for overdose and death among youth. As a result, preventive measures to safely store and dispose of medications are often not taken which makes intentional overdose a viable option for those contemplating suicide.
3. Pharmacists in Canada are not required to receive mental health or crisis response training, yet research by Murphy et al. (2017 and 2018) shows that they frequently encounter individuals who are at-risk of suicide and intervene during a crisis. Pharmacists have advocated for increased suicide prevention training and the general public has expressed support for increased pharmacist involvement in suicide risk assessment.
4. The development educational materials for parents and youth to address misconceptions about the harms of medication, and safe storage and disposal methods. We will also explore opportunities to collaborate with community pharmacists to organize SafeTALK and ASIST training sessions, and to work with hospital staff to develop means restriction counselling and lock box distribution for parents of youth who have been hospitalized for intentional overdose.

Issue and Context

Suicide refers to an intentional self-inflicted death, while a suicide attempt refers to a non-fatal attempt of self-harm with the intent to die.¹ Suicide is a complex issue which impacts a significant proportion of the population. In 2009, the rate of death by suicide in Canada was estimated at 11.5 per 100,000 people.² Results from the 2015 Ontario Student Drug Use and Health Survey reported that 113,500 students in grades 7-12 (12%) had serious thoughts of suicide, while 27,000 students (3%) reported a suicide attempt in the past twelve months.³ Common risk factors for suicide among youth include: a history of psychiatric disorders, substance abuse, social disadvantage, parental history of mental health disorders, family history of suicidal behaviour, and adverse childhood experiences.⁴

Data from Statistics Canada (2014) has shown that hospitalizations due to intentional self-harm (ISH) have been increasing among youth in recent years, particularly among young females.⁵ Hospital data from Brant County (2015-2017) indicate that emergency room (ER) visits due to ISH are consistent with Canadian trends. In 2013-2014, approximately 2,500 hospitalizations among Canadian youth aged 10 to 17 were attributed to intentional self-harm.⁵ Comparatively, there were 247 hospitalizations for ISH among youth aged 10-19 in Brant County (2015-2017), with females accounting for 75% of all cases. Among both females and males, 15 to 19 year olds account for the highest proportion of total ISH ER cases (20% and 7% respectively), followed by 20 to 24 year olds (10% and 5% respectively). Self-poisoning is the most common means of ISH in Brant County, with the following classes of substances most commonly used:

- Antiepileptic, sedative-hypnotic, anti-Parkinsonism, and psychotropic drugs (36%)
- Non-opioid analgesics, antipyretics and antirheumatics (16%)
- Narcotics and psychodysleptics (hallucinogens) (11%)

Means restriction is a population-level approach to suicide prevention that removes or restricts access to lethal means.⁶ This approach limits an individual's ability to obtain the means necessary for a fatal suicide attempt.⁶ In contrast to clinical interventions, means restriction often impacts individuals whose suicidal intent has been undetected or have not otherwise sought support for suicidal ideation.⁶ Furthermore, means restriction is one of the only proven effective suicide prevention interventions.⁷ Given the high incidence of intentional overdose among youth in Brant County, a literature review was conducted to explore community-level interventions to limit access to medications as a means to attempt or complete suicide among this population.

Literature Review Question

What community-level interventions exist to restrict access to medications as a means to attempt or complete suicide among youth?

Population:	Children and youth
Intervention:	Community-level means restriction or education-based interventions
Comparison:	No intervention
Outcome:	Primary - reduced access to prescribed or over-the-counter medications Secondary - reduced suicide attempts and/or completions

Literature Search

The literature search was completed with the assistance of the hub librarian. Two searches were conducted in September and October 2018. The first search was conducted in MedLine, Embase, and Health Evidence, and included an internet search of the grey literature, including a search of resources catalogued by the Suicide Prevention Center. The first search was not restricted by language, year of publication, or study type. A second search was conducted to focus on intentional overdose literature. Results were limited to the years 2000-2018, and English-only publications. This search revealed many individual case reports of intentional overdose and clinical trials. As such, no articles from the second literature search were included due to a lack of relevance to the PICO question. The detailed search strategies are available upon request.

Relevance Assessment

One reviewer independently screened titles and abstracts and conducted full-text screening of selected articles. The following criteria were used to assess relevance to the research question:

Inclusion Criteria

- Means restriction interventions focused on prescription or over-the-counter medications
- Education-based interventions targeting youth, parents or community pharmacists
- Proposed community-level interventions informed by descriptive studies
- Published in English
- Systematic reviews, quantitative or qualitative primary studies, grey literature

Exclusion Criteria

- Means restriction interventions focused on unrelated lethal means including firearms, pesticides, or carbon monoxide
- Case studies describing attempted or completed suicides of individual patients
- Research advocating for unspecified methods of means restriction

- Duplicate studies
- Non-English studies

Results of the Search

A total of 1,474 academic and grey literature citations were obtained from the search, which included 749 results from the first search, and 725 results from the second search. All materials were subjected to title and abstract screening and were assessed for relevance to the PICO question. A total of 50 articles were considered potentially relevant and underwent full-text review. Upon review, 45 articles were excluded for being irrelevant or non-specific. A total of 5 articles met the inclusion criteria, including 4 primary research studies (2 experimental studies, 2 descriptive studies), and 1 scoping review. A flow chart describing the details of the search is included in Appendix A.

Critical Appraisal

All of the included studies were critically appraised by one independent reviewer. The three quantitative studies were appraised using the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool for Quantitative Studies, the qualitative study was appraised using the Critical Appraisal Skills Programme (CASP) Qualitative Checklist, and the scoping review was appraised using the Quality Assessment Tool for Review Articles by Health Evidence.⁸⁻¹⁰ Of the five total articles included in this review, one article was rated as strong, and four articles were rated as moderate quality. While some articles received a weak score based on the predetermined criteria of the quality assessment tools, these articles were objectively appraised as being of moderate quality. This assessment was based on the understanding that suicide cannot often be ethically or feasibly studied using blinded, randomized study designs. As such, no articles were excluded based on a weak quality score.

Description of Included Studies

Garbutt et al. (2018): *Opioids in adolescents' homes: Prevalence, caregiver attitudes, and risk reduction opportunities.*¹¹

The objective of this descriptive study, rated as moderate, was to “assess knowledge, attitudes and behaviours of adolescents’ caregivers regarding prescribed opioids in the home.” Self-administered surveys were completed by 700 caregivers of youth over age 10 who were attending pediatric clinics in Washington, U.S. The 23-item survey assessed whether opioids were present in the home, whether or not leftover prescriptions would be disposed of, if the caregiver was willing to share opioids with their child, and perceived risk of addiction and suicide among opioid users.

Kruesi et al. (1999): *Suicide and violence prevention: Parent education in the emergency department.*¹²

The objective of this prospective cohort study, rated as moderate, was to determine whether injury prevention education delivered to parents in the emergency department was associated with new action to limit access to lethal means. Means restriction education was received by 41 of 103 eligible parents who were accompanying a child aged 6-19 years old to the emergency department of a rural U.S. hospital for a mental health assessment. Means restriction education involved three components, 1) informing parents that their child was at an increased risk for suicide, 2) informing parents that they can reduce their child's risk of suicide by limiting access to lethal means, and 3) educating parents on ways to restrict access to lethal means. Follow-up telephone interviews were conducted several weeks post-intervention to assess recall and behaviour change in regards to lethal means restriction.

Murphy et al. (2017). *A scoping review of community pharmacists and patients at risk of suicide.*¹³

The objective of this scoping review, rated as moderate, was to “characterize the existing body of literature around pharmacists’ roles and interventions in suicide risk assessment and mitigation” with the intent to identify research gaps and make recommendations for future research and practice decisions. A total of 35 peer-reviewed publications and 12 grey literature items were included in this review. Included articles were a range of opinion pieces, survey study designs, and intervention studies.

Murphy et al. (2018): *Community pharmacists’ experiences and people at risk of suicide in Canada and Australia: A thematic analysis.*¹⁴

The objective of this descriptive qualitative study, rated as strong, was to “explore Canadian and Australian community pharmacists’ practice experiences in caring for people at risk of suicide.” An open-ended online survey was distributed to pharmacists in Canada and Australia and eligibility was restricted to individuals who currently or previously practiced in community pharmacy. The first part of the survey collected demographic data and adapted versions of the Attitudes Toward Suicide (ATTS) and Stigma of Suicide Scale (SOSS). Respondents were asked to describe their most prominent experiences with suicidal patients, which were subjected to thematic analysis. A total of 176 responses were received.

Runyan et al. (2016): *Lethal means counseling for parents of youth seeking emergency care for suicidality.*¹⁵

The objective of this prospective cohort study, rated as moderate, was to evaluate the effectiveness of “lethal means counseling for parents of youth who were admitted to the emergency department for suicidality.” Parents of youth aged 12 to 17 years old who had expressed suicidal ideation or had attempted suicide received means restriction counselling upon discharge from an emergency psychiatric services facility in Colorado, U.S. Counselling aimed to educate parents about risk factors for suicide and to encourage the use of a lock box or other secured method for safe storage of medications and firearms during their child’s mental health

crisis. Follow-up telephone interviews were conducted to assess parental recall of counselling and subsequent behaviour changes regarding safe storage practices.

Synthesis of Findings

Prescription and over-the-counter medications are accessible within the homes of youth, and caregivers underestimate the risks they pose. 35% of caregivers of youth over the age of 10 report having active or leftover opioid prescriptions in the home.¹¹ While 69% agree that opioids are a commonly abused drug among adolescents, 52% report being unaware that opioids are commonly used as a means for youth to attempt suicide.¹¹ As a result, 13% of caregivers report that they would consider providing opioids to an adolescent for pain relief.¹¹ Retaining leftover medications in the home is common, with 61% of caregivers reporting that this is deliberate. Reasons for intentionally retaining leftover medication include: future use by self or others (60%); large quantities remaining (12%); and not wanting to waste expensive medication (10%).¹¹ Reasons for unintentionally keeping leftover medication include: not getting around to disposing (31%); not knowing proper disposal mechanisms despite wanting to get rid of them (16%); and not considering a need to dispose of leftover medication (8%).¹¹ The authors suggest a need for education on the risks of opioids among children and adolescents, as well as safe and proper disposal and storage methods.¹¹ Pediatricians have been proposed as potential allies to deliver opioid safety education.¹¹

Pharmacists play an integral role in suicide prevention within the community despite a lack of training. Patients often confide in pharmacists by disclosing thoughts of suicide, requesting assistance for a suicide attempt, and contacting pharmacists during an active suicide attempt involving intentional overdose.¹⁴ Pharmacists in Canada are not required to have formalized mental health training, yet increasingly report a need to recognize and respond to signs of suicide among their patients, in addition to their role as gatekeepers of the medication supply.^{13,14} Consequently, pharmacists feel ill-equipped to respond to situations involving suicidal patients due to lack of training in crisis interventions. Feelings of discomfort, fear, powerlessness, and frustration are common, which often result in pharmacists not directly asking patients if they have thoughts of suicide.¹⁴ Pharmacists advocate for increased education and training to increase their knowledge, attitudes and confidence to adequately respond to suicidal patients, and to educate the public on medication risks and signs of suicide.¹³ Similar sentiments have been expressed by the public who increasingly support participation of pharmacists in suicide prevention.¹⁴

Brief lethal means counselling results in behaviour change to restrict access to lethal means. Parents who received means restriction counselling were significantly more likely to restrict access to lethal means within the home compared to parents who did not receive the counselling intervention (adjusted OR=3.6, $p=0.04$).¹² Upon receiving lethal means counselling, there was a 67% increase in the number of parents who reported locking up all medication in the home at 9-weeks follow-up compared to the time of child hospitalization ($p=0.0016$).¹⁵ Free lock boxes were accepted by 79% of parents who received lethal means counselling which facilitated positive behavior change.¹⁵

Limitations and Gaps

While means restriction is a well-recognized and highly effective suicide prevention intervention, the majority of evidence is focused on restriction of firearms and pesticides. As a result, minimal evidence exists for restricting access to prescription and over-the-counter medications, particularly among youth populations.

The existing literature primarily suggests potential strategies that have not yet been implemented or evaluated. While evidence-based interventions are limited, this presents an opportunity for the Brant County Health Unit (BCHU) to develop a novel approach to medication means restriction.

The current literature review included descriptive studies to understand individual perceptions, attitudes and experiences using self-reported surveys, and two experimental studies involving small samples sizes. As such, the results should be interpreted conservatively as the findings may not be generalizable to Brant County. Finally, only one reviewer conducted article screening and critical appraisal which is subject to personal bias.

Practice Implications

A two pillar approach is recommended to address intentional overdose among youth in Brant County:

1. Prevention

- Pharmacists should receive safeTALK Training and Applied Suicide Intervention Skills Training (ASIST) to develop the necessary skills to effectively recognize and respond to signs of suicide within the community.
- Educational resources should be developed in partnership with pharmacists to educate parents and youth on the risks of medication misuse, safe storage, and proper disposal.

2. Intervention

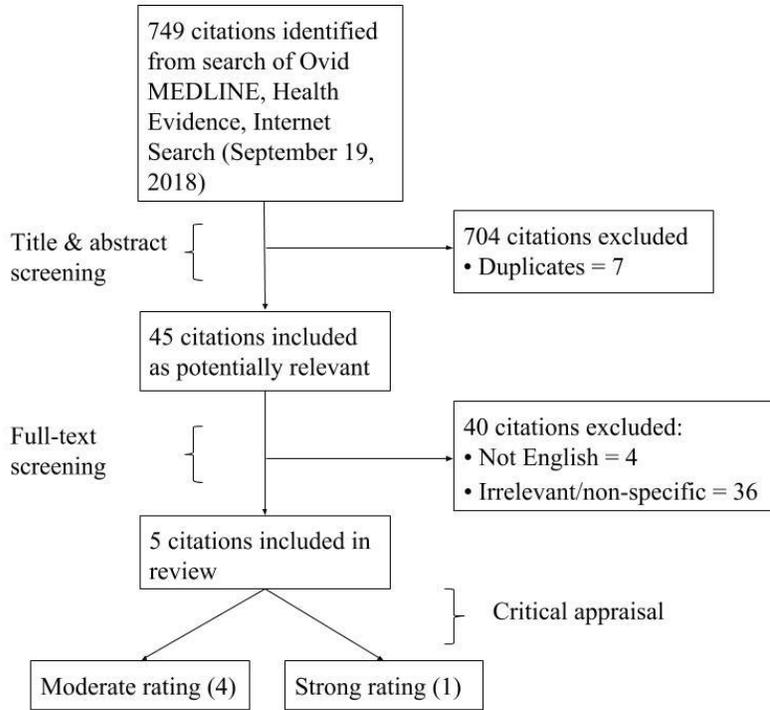
- Brief means restriction counselling should be provided to caregivers upon discharge of an adolescent from the hospital following an intentional overdose. Counselling should 1) inform caregivers that safe storage or removal of medications from the home can limit the likelihood of a suicide attempt, and 2) educate caregivers on safe storage and disposal practices.
- Free lock boxes should be available for parents and caregivers to encourage safe storage of medications.

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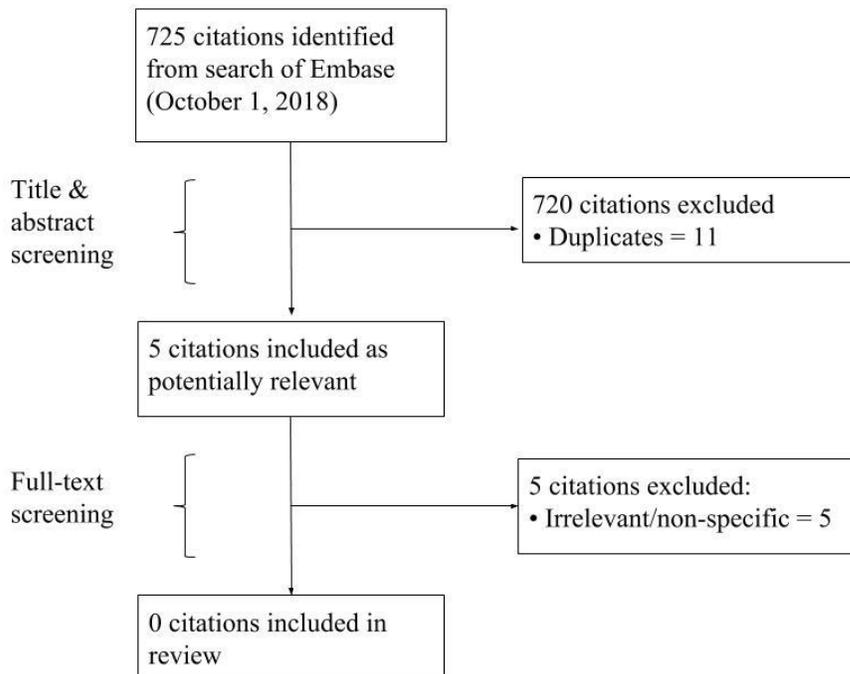
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Appendix A: Literature Search Flow Chart

Literature Search - September 19, 2018



Literature Search - October 1, 2018



Appendix B: Data Extraction Table

Study Description	Objectives	Subjects	Methods	Results/Conclusions
<p>Author: Garbutt, et al.</p> <p>Year: 2018</p> <p>Country: United States</p> <p>Design: Descriptive study</p> <p>Quality rating: Moderate</p>	<p>To assess the attitudes, knowledge and behaviours of adolescents' caregivers regarding prescribed opioids in the home.</p>	<p>700 caregivers of youth who frequently lived with youth aged 10 years or older</p>	<p>A self-administered 23-item survey was completed by caregivers in the waiting rooms of pediatric centres</p>	<p>Opioids are common in the homes of children and many caregivers are unaware of the risks they pose. 34.6% of caregivers reported opioids currently in the home, with 66.0% intending to keep leftover medication, and 60.5% already retaining leftover medication for future use. 30.6% kept medication unintentionally, with 15.7% reporting not knowing the proper disposal method, and 7.5% not realizing the need to dispose of leftover medication. 13.0% of caregivers indicated they would consider giving opioid medications to adolescents for pain management.</p>
<p>Author: Kruesi, et al.</p> <p>Year: 1999</p> <p>Country: United States</p> <p>Design: Prospective cohort</p> <p>Quality rating: Moderate</p>	<p>To determine if injury prevention education results in behaviour change towards lethal means restriction.</p>	<p>Parents and caregivers of children aged 6-19 years old who were admitted to the ED for mental health assessment or treatment.</p> <p>41 parents received the training intervention and 62 parents did not</p>	<p>ED staff provided means restriction training to 41 out of 103 eligible families. Training informed parents that restricting access to lethal means (firearms, medications) could reduce risk of suicide.</p> <p>Follow-up phone calls (N=70) were conducted to assess whether</p>	<p>Exposure to means restriction education was associated with new action to restrict access to lethal means (OR=3.6, $p=0.04$)</p> <p>Parents were more likely to lock up rather than dispose of lethal means</p>

		receive the training 70 parents were contacted for follow-up	parents engaged in means restriction following training.	
<p>Author: Runyan, et al.</p> <p>Year: 2016</p> <p>Country: United States</p> <p>Design: Prospective cohort</p> <p>Quality rating: Moderate</p>	To assess the effectiveness of lethal means counselling to parents of youth seeking emergency care for suicidality.	209 parents who accompanied patients aged 12-17 who were admitted to psychiatric emergency services for suicidal ideation or attempted suicide	<p>Upon discharge, parents received a 5-minute counseling session informing that access to medications and firearms are particularly dangerous and should be secured. Parents were offered a free lock box to take home.</p> <p>Follow-up telephone interviews (N=114) were conducted within 9 weeks post-discharge to assess recall and behaviour change.</p>	Self-reported storage of medications increased significantly following lethal means counselling from 9% to 76% ($p=0.0016$). 79% of parents accepted a free lock box. Majority of parents were receptive to counselling upon discharge, demonstrated good recall of information, and engaged in substantial change of practice for safe storage.
<p>Author: Murphy, et al.</p> <p>Year: 2018</p> <p>Country: Canada, Australia</p> <p>Design: Descriptive</p>	To explore the experiences of Canadian and Australian community pharmacists who provide care for people at risk of	176 Canadian and Australian community pharmacists	<p>Self- administered online survey with open-ended responses which were adapted versions of the Attitudes Toward Suicide and Stigma of Suicide Scale</p> <p>Qualitative thematic</p>	Community pharmacists report frequent interactions with clients who are at risk of suicide, despite a lack of training. The main emergent themes included: the need to triage and refer clients to emergency services, assessing suicidality risk, and not directly asking clients about suicidality as a result of feeling ill-equipped to handle such situations.

study	suicide.		analysis	
Quality rating: Strong				
<p>Author: Murphy, et al.</p> <p>Year: 2017</p> <p>Country: Canada</p> <p>Design: Scoping review</p> <p>Quality rating: Moderate</p>	To understand the roles and responsibilities of pharmacists regarding suicide risk assessment and prevention.	35 publications and 12 grey literature items	<p>Search of OVID Medline, Embase, PsycINFO, CINAHL, Web of Science, International Pharmaceutical Abstracts, Google Advanced, Open Grey, and mobile apps</p> <p>Subjected to inclusion and exclusion criteria for relevance</p>	Education and training is needed to improve the knowledge, attitudes, confidence and capabilities of pharmacists, and to educate patients and families about medication harms and warning signs of suicide. Gatekeeping the medication supply requires an understanding and recognition of risk factors for suicide. There is an expressed need to increase the role of pharmacists in suicide risk assessment and mitigation.