

Dawson College Shooting, September 13, 2006:

Report on a study conducted with
students and staff of Dawson College
on the psychological impact of the
incident and the search for support



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Research Team

Alphabetical order

Pierre Bleau, M.D., FRCPC, Psychiatrist – Team coordinator – Medical Director of the Anxiety Disorders Program of the MUHC, Assistant professor, Department of Psychiatry, McGill University.

Richard Boyer, M.A. (Soc.), Ph. D., Researcher, Department of Psychiatry, Université de Montréal and Fernand-Séguin Research Centre of the Louis-H. Lafontaine Hospital.

Stéphane Guay, Ph. D., Research psychologist, Director of the Trauma Studies Centre, Fernand-Séguin Research Centre of the Louis-H. Lafontaine Hospital and Associate professor, School of criminology, Université de Montréal.

Alain Lesage, M.D., FRCPC, M.Phil., Psychiatrist – Professor, Department of Psychiatry, Université de Montréal and Fernand-Séguin Research Centre of the Louis-H. Lafontaine Hospital.

Monique Séguin, Ph. D., Professor, Université du Québec en Outaouais, McGill Group for Suicide Studies, Douglas Mental Health University Institute.

Warren Steiner, M.D., FRCPC, Psychiatrist-in-Chief, Department of Psychiatry, McGill University Health Centre (MUHC.), Associate professor, Department of Psychiatry, McGill University.

Nadia Szkrumelak, M.D., FRCPC, Psychiatrist – Associate Psychiatrist-in-Chief, Department of Psychiatry, McGill University Health Centre (MUHC) , Assistant professor, Department of Psychiatry, McGill University.

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Thank you...

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A very special thank you to all those who agreed to participate in remembering these tragic events: the students, the support staff, the teachers, the professionals, the administrators and the first responders and mental health professionals, the parents, and especially, the family of Anastasia De Sousa.

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To the Honourable Jean-Marc Fournier,

Minister of Justice for Quebec

On September 13, 2006, an armed individual burst into Dawson College, killing one person, wounding 19 others, and subsequently killing himself. It was the third tragedy of this kind to occur in Quebec; a tragedy that has left its mark in our collective memory.

It was the hope of Dawson College, in accordance with its teaching mission, that an analysis of the intervention would improve the psychosocial support offered in the event that such an incident were ever to occur again.

It is in this context that the Research Institute of the McGill University Health Centre (MUHC) received funding in 2007 from the Government of Quebec to study the psychological impact of this dramatic event. In order to do so, a dynamic inter-academic collaboration was created with McGill University, the Université de Montréal and the Université du Québec en Outaouais, as well as with Dawson College. In addition to examining the psychological impact of this dramatic event on the population exposed to the event, the study allowed for the evaluation of the existing emergency psychological intervention plan and for the proposal of an intervention plan model for responding to similar situations.

Under the scientific direction of Dr. Alain Lesage, our team, made up of researchers from the Fernand-Seguin Research Centre of Louis-H. Lafontaine Hospital, the McGill Group for Suicide Studies and the Research Institute of the McGill University Health Centre, would like to present to you the following four documents:

- Evaluation of the emergency psychological intervention plan;
- Report on a study conducted with students and staff of Dawson College on the psychological impact of the incident and the search for support;
- SECURE (Support, Evaluation and Coordination United for Recovery and Education): a multimodal psychological intervention program;
- Summary and recommendations.

By presenting these documents, the associated researchers wish to bring the necessary information to the health, education, justice and public security networks so that they may intervene efficiently in the context of a dramatic event such as the one experienced on September 13, 2006 at Dawson College.

Dr. Pierre Bleau
Medical Director of the Anxiety Disorders Program,
McGill University Health Centre

SUMMARY OF THE STUDY RESULTS

A research study using standardized instruments was conducted 18 months after the event among the students and employees who were at Dawson College on September 13, 2006. Among the 10,000 students and employees, 948 agreed to participate in the study by answering the questionnaire, either computer-assisted in a room set up for this purpose at the College (28%) or on a secure website (72%). The project had received the approval of the research ethics committees at Dawson, the McGill University Health Centre and the Fernand-Seguin Research Centre of the Louis-H. Lafontaine Hospital. The questionnaires used to evaluate mental disorders, health perception and use of services are similar to those used in 2002 by Statistics Canada in the Canadian Community Health Survey, Cycle 1.2 on Mental Health and Well-being (CCHS 1.2). A severity of exposure scale specific to the Dawson shooting was developed for this study, with a gradient taking into consideration the number of situations experienced and the trauma risk associated with each situation.

The study's main results can be summarized as follows:

- The vast majority of respondents (79%) were present at the College during the shooting. More than a third of the respondents said they witnessed someone being wounded or killed by the shooter; 50% heard gunshots; 52% hid with other people (the respondents may have experienced more than one of these situations). After the shooting, approximately 18% of the respondents developed a mental disorder even though they had never had one before in their life. While an increase in episodes of posttraumatic stress disorder (PTSD; 2%) was expected, other disorders were observed, such as major depression (5%), alcohol dependency (5%) or social phobia (3%). Moreover, some people having already experienced mental disorders continued to experience them in the 18 months following the shooting. A total of 30% of the respondents suffered from one of the mental disorders studied. This is actually twice as many as the number observed in Quebec in the CCHS 1.2. The exposure to the shooting seemed to be associated with suicidal ideations (7%) and suicide attempts (1%); these numbers are also close to twice as high as those observed in the CCHS 1.2. The psychological impact was still present 18 months after the event, with respondents reporting a poorer perception of their mental health than in the CCHS 1.2, and more than 7% continue to present symptoms of posttraumatic distress.
- The greater the severity of the exposure specific to the shooting, the greater the risk of experiencing PTSD, an anxiety disorder, depression or alcohol dependency.
- Almost 5% of the Dawson population consulted a mental health professional for the first time in their lives after the shooting; the rate was even higher amongst those who had previous contact with mental health professionals. In the 18 months following September 13, 2006, a total of nearly 13% consulted a mental health professional (for example, 6% consulted a psychiatrist; 7% a general practitioner; 7% a psychologist). In this regard, the Dawson population was not much different from the Quebec population in 2002, with the exception of a greater accessibility to psychiatrists, probably because of the role they played in the psychological response to the event. However, close to 14% of the sample said they used the Internet for mental health questions during the period after the shooting, and this was very different from the Quebec population in 2002 (0.5%).
- More than 80% of those having consulted at least one resource felt they had received at least one satisfactory service, but close to half said they would have needed an additional service. Among the additional services required, information and psychotherapy/counselling were cited most frequently. The majority of people presenting a mental disorder after the shooting did not consult, and this was no different from the search for support in the Quebec population having a mental disorder. The reason cited most often for that was acceptability (the problem will go away by itself...), even though this was clearly not the case after 18 months for many respondents, as indicated earlier. Accessibility to services was also cited as a reason by 14% of respondents, who felt their need for support was not met.



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The psychological impact of the Dawson shooting was considerable, with 30% of the population affected, twice the expected rate.

- As is the case after other tragedies, the psychological wounds touched more people than the physical ones. The psychological impact of the Dawson shooting was considerable, with 30% of the population affected, twice the expected rate. Those people having already experienced a mental disorder showed themselves to be more vulnerable, and their mental disorders continued. The greater and closer the exposure to the event, the greater the risk of developing a mental disorder, to the point where any person with a very close exposure to the event (seeing the killer, being wounded, witnessing people being wounded, having a loved one be killed or wounded) should be considered psychologically wounded; those with a lesser exposure are still twice as likely to be psychologically wounded as the general population. The majority of students and employees with psychological wounds did not consult professionals, but given their extensive use of the Internet as a resource to inform themselves, the majority would have been willing to consult if there had been a link between the Internet sites and mental health services, facilitating the expressed wish to receive psychotherapy/counselling. While the respondents having used the services were satisfied, the majority's need for help were not met if one considers that effective treatments exist, including psychotherapies, for all the mental disorders and substance abuse problems identified in the Dawson population. In many cases, the disorders were not temporary, and 18 months after the event, the need for support that was clearly identifiable in the first days, even in the first months, was still present. The issues mentioned by the Quebec population in 2002 were the same as those mentioned by Dawson students and employees: make potentially effective treatments acceptable and available within the framework of a public health care and social services network.

INTRODUCTION

The Event

On September 13, 2006, a shooter acting alone entered Dawson College armed with an assault rifle and a pistol. He randomly attacked students, and employees, eventually killing one student and wounding 19 other people before taking his life.

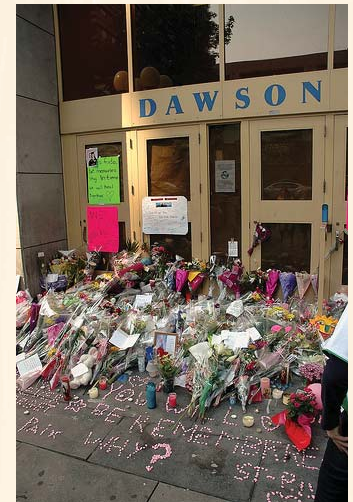
This shooting can be viewed in the broader context of a series of violent incidents that have taken place in various schools, colleges and universities around the world. In Montreal, the attack at Dawson College was the third school shooting since 1989, preceded by the École Polytechnique massacre of that year and by the attack by a professor on his colleagues at Concordia University in 1992. In North America, there have been 33 fatal school shootings with multiple victims in a school environment over the last 20 years, with an even greater number during this period of non-fatal attacks or attacks with only one victim. In the 2006-2007 academic year alone, five fatal school shootings with multiple victims occurred, first in North Carolina, followed by incidents in Quebec, Colorado, Pennsylvania and Virginia.

Rationale for conducting an epidemiological investigation

In order to accurately assess the psychological impact of such an event, our study included, in addition to interviews with the key groups described in the *de facto* plan (The Dawson College Shooting of September 13th, 2006: Evaluation of the emergency psychological intervention plan, Roy, D. *et al.*, 2010). Even though it was possible to collect information on the psychological repercussions from those responsible for the various services offered to the affected population, this source of information does not adequately represent everyone. Actually, few people consult professionals after such an event, and those are usually the most severe cases. Moreover, the available information in the clients' files is confidential, and the content and form of this information obviously varies from one service to another, making it difficult to interpret.

The epidemiological investigation is therefore a crucial source of information to accurately estimate the psychological impact of such an event. It is structured to estimate the state of psychological health of the affected population. It is conducted using a representative sample who gave their informed consent. Moreover, the evaluation of the psychological impacts is done by using standardized instruments validated by previous research. It is therefore possible to analyze several facets of the mental health, such as the presence of anxiety disorders, including posttraumatic stress disorder, affective disorders as well as psychoactive substance abuse and dependency.

The collection of data on psychological signs and symptoms makes it possible to determine if such signs and symptoms precede or follow exposure to the potentially traumatic event, The researchers therefore obtain estimates of the prevalence (active cases in a given population) and incidence (new cases in that population) of the various disorders studied following the event. Finally, the questionnaires used in this research include a series of questions on the socio-demographic and health characteristics of each respondent. It allows the researchers to study the variations of prevalence and incidence as a function of the characteristics of the respondents.



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There are epidemiological studies led by researchers following collective trauma, but for completely different types of traumatic events

What we know about the psychological impact of events similar to the one at Dawson College

Despite the frequency of these incidents, there are very few empirical studies on the psychological effects of this type of traumatic event in a school environment. The only available documents listed are observation reports on the causes and consequences of such violent acts as well as suggestions on ways to intervene. There are epidemiological studies led by researchers following collective trauma, but for completely different types of traumatic events (e.g. the attacks on New York City and Washington on September 11, 2001).

Posttraumatic stress disorder (PTSD) is a psychiatric disorder frequently associated with exposure to a traumatic event, and the risk of developing it is higher following a violent criminal act, particularly for women (Tolin & Foa, 2006).

Between 17.8% and 38.5% of victims of a criminal act develop PTSD (Breslau *et al.*, 1991; Brewin, Andrews, Rose, & Kirk, 1999; Kessler *et al.*, 1995; Resnick, *et al.*, 1993). The person suffering from PTSD must have been exposed to or confronted with a traumatic situation where there is a perceived threat to his/her life or physical integrity (or that of another).

According to the DSM-IV-TR (APA, 2000) criteria, this event must have created an emotional response characterized by intense fear, horror or helplessness (Criterion A). Moreover, the person suffering from PTSD is affected by symptoms from each of three symptom clusters:

- (B) Persistent re-experience of the traumatic event (e.g. flashbacks, nightmares);
- (C) Persistent avoidance of stimuli associated with the trauma (e.g. thoughts, conversations or activities conjuring memories of the event) and numbing of general responsiveness;
- (D) Persistent symptoms of increasing arousal (e.g. irritability, hypervigilance, startle).

The symptoms must last more than a month and create clinically significant suffering in the person. As specified in the DSM-IV-TR, PTSD is considered “chronic” when the symptoms last for three months or more. The simple passing of time rarely completely cures PTSD, and the majority of people struggling with this psychological disorder do not seek or obtain the help they need (Kessler *et al.*, 1995).

In addition to PTSD, affective and anxiety disorders as well as substance abuse are also frequent in this type of victim. Victims of violence actually present the higher levels of anxiety and depression in the months following the trauma compared to victims of traffic accidents (Norris & Kaniasty, 1994).

Furthermore, the risk of developing stress symptoms seems to vary according to certain characteristics of individuals and the severity of the event (or degree of exposure) to which the individual is exposed (Martin, Germain, & Marchand, 2006). In order to evaluate the severity of the exposure to the shooting of September 13, 2006, the research team developed a scale of shooting exposure severity by which it can determine whether the risk of PTSD and other mental disorders increases with the intensity of the exposure.

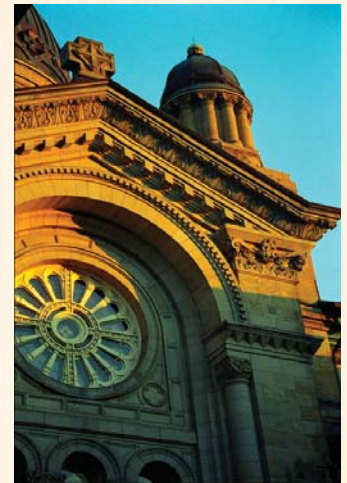
The scientific literature regarding the impact of a shooting on the psychological health of students and employees is limited. Moreover, the scientific literature is also lacking in regard to the epidemiological importance of PTSD among the general population of all ages in Canada. Only three studies have been conducted in Canada. The Stein *et al.* study (1997) conducted in 1994 with a sample of Winnipeg residents (n=1,002) reports a prevalence of 2.0% during the last month. The difference observed between men and women is not statistically significant. The Frise *et al.* study (2002) is very limited, since a prevalence of 10.7% during the last month is estimated with the help of a single question. The Van Ameringen *et al.* study (2008) was a telephone survey with a representative sample of Canadians (n=2,991), including a sample in Quebec (n=720). The data collection instrument is essentially the same as the one used for the present study (Composite International Interview Schedule). The lifetime prevalence reported is 9.2%, 5.3% of men and 12.8% of women (p<0.05). The authors report a prevalence of 2.4% during the last month. The difference of prevalence among men (1.3%) and women (3.3%) is statistically significant.

Since the present study also focuses on the impact of the shooting in terms of risk for other mental disorders likely to appear in such circumstances (affective and anxiety disorders, substance abuse, suicidality), these results will be compared to those obtained in a recent mental health investigation conducted on the Quebec population (Kairouz *et al.*, 2008).

Goals of the Study

The general goal of this epidemiological investigation is to evaluate the psychological, pedagogical, professional and social repercussions of the September 13, 2006 shooting on the students and employees of Dawson College.

This research report is nonetheless limited to the description of the psychological impact on students and employees of Dawson College as measured by the appearance of mental disorders as well as suicidal ideations and behaviours, with a specific focus on posttraumatic stress disorder. The report also evaluates the impact of different degrees of exposure to the traumatic event of the shooting on the emergence of these disorders and phenomena. It will also allow for a description of the different profiles of use and non-use of the psychological support services offered at Dawson College and by the various health organizations based on the needs.



A total of
948 respondents
were recruited.
854 students and
94 employees.

METHODOLOGY

Population of reference

The population studied is composed of all the students (n=8,779) and employees (n=1,312) of Dawson College on September 13, 2006.

Sampling

The students and employees selected to constitute a simple random sample were contacted by mail; they were presented with the goals of the study and informed that a member of the research team would phone them to answer their questions and solicit their participation. After this initial contact, the research assistant communicated with the respondent to either come in for a face-to-face encounter or to complete the questionnaire online.

A consent form was signed by the respondent before answering the questionnaire. The sampling of the Dawson students and employees was made in collaboration with Dawson College and with the support of the student and labour unions and the Employee Assistance Program. The project was approved by the research ethics committees of the McGill University Health Centre, Dawson College and the Centre de recherche Fernand-Seguin.

The research plan specified a simple random sample of 2,000 respondents which proved to be impossible to achieve. In the end, a total of 948 respondents were recruited, 854 students and 94 employees. This is therefore a sample of convenience which cannot be considered fully representative of the total population. To compensate for this, the respondents were weighted to allow the sample distributions to better reflect the characteristics of Dawson College population with regards to sex and status (student/employee). After this weighting, the ratios of men to women and students to employees within the sample are identical to those of the population under study. It is reassuring to note that the proportion of students who reported being present at the College during the shooting obtained in the sample is approximately 80%, which corresponds to the estimate made by the Dawson College administration.

Measuring Instruments

Data gathering was conducted with the help of a measuring instrument specifically developed for the purpose of conducting this study. It was constructed using several validated questionnaires. Since the present report addresses only a portion of the collected data, only the measuring instruments for which results are presented are described below.

- **Composite International Diagnostic Interview (CIDI):** The prevalence of mental disorders before and after September 13, 2006 and the incidence of those disorders after that date were estimated with the help of a computerized bilingual version of the Composite International Diagnostic Interview (CIDI) for the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV). The CIDI version used for this investigation (CIDI/Dawson) was constructed from the one used by Statistics Canada for the Canadian Community Health Survey, Cycle 1.2 on Mental Health and Well-being (CCHS 1.2) and the Canadian Community Health Survey (Canadian Forces Supplement). The CIDI/Dawson version covers major depressive episodes, the main anxiety disorders (posttraumatic stress disorder, social phobia, agoraphobia (with or without panic disorder) and the disorders associated with substance (alcohol and illegal drugs) abuse and dependency.
- **Socio-demographic characteristics:** Several questions were added to the CIDI, allowing for determination of status of student or employee and academic characteristics.

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- **Shooting Exposure Severity Scale:** The proximity and exposure profiles to the September 13, 2006 shooting were estimated using the Shooting Exposure Severity Scale. The research team developed an ad hoc questionnaire based on the model suggested by Simeon et al (2003), and it was validated during the investigation. This scale establishes the degree of exposure to the shooting based on whether the respondent was inside or outside the College.
- **Posttraumatic Stress Disorder Checklist Scale (PCL-S):** A second measure of post-traumatic stress disorder was obtained with the PCL-S. This self-administered instrument includes 17 questions which respondents answer using a 5-level Likert scale (Not At All to Extremely). The French version of the instrument was validated by Ventureyra et al. (2002).
- **Mental Health Services and Psychotropic Medication:** The use of health services and medication for mental health reasons during the year before and after September 13, 2006 was estimated thanks to the use of the Mental Health Services and Psychotropic Medication components in Statistics Canada's CCHS 1.2 in 2002. These components cover the use, sites, costs of and satisfaction with the services set in place specifically after the shooting. The results of the 2002 CCHS 1.2 for Québec with this component on services are in a report by the Institut de la statistique du Québec (Lesage *et al.*, 2008) and will be used as a reference point for the Dawson study results.
- **Perceived Need for Care Questionnaire (PNCQ):** The Perceived Need for Care Questionnaire (PNCQ), used in the Australian Mental Health Survey (1997 and 2007) and in the Canadian Forces Supplement of the CCHS 1.2 study conducted by Statistics Canada in 2002, was used to estimate needs that were not fulfilled by mental health services. The questionnaire covers the use of services in the year after September 13, 2006 and explores the need for intervention (medication, psychotherapy, pedagogical aide, support at work, information).
- **Suicidal ideations and suicide attempts:** A series of standardized questions identifies the respondents having seriously considered suicide or having made a suicide attempt in their life and in the 18 months following the shooting.

- The following questions may be sensitive to some people, but we have to ask the same questions of everyone.

- Have you **seriously** thought about committing suicide?
- Since September 13, 2006, have you **seriously** thought about committing suicide?
- Have you attempted suicide?
- Since September 13, 2006, have you attempted suicide?

These questions are frequently used in important health investigations conducted by Statistics Canada and the Institut de la statistique du Québec. Moscicki (1989) demonstrated that these questions are widely used instruments in health studies.

- **Self-perception of physical health:** A state of physical health index was obtained with a standardized question on the perception of physical health: "The next questions are about your well-being and areas of your life that could affect your physical and emotional health. Take your time to think about each question before answering. In general, would you say your mental health is: excellent, very good, good, fair, poor?"

This type of measure is frequently used to measure the concept of need (Mossey & Shapiro, 1982), and several studies have shown that the global perception of the state of health is strongly correlated to the diagnosed state of health and the mortality risk





(Goldstein, Siegel & Boyer 1984; Burström & Fredlund, 2001). This question is asked in all the important health investigations conducted by Statistics Canada and the Institut de la statistique du Québec.

- **Satisfaction with life:** An index of the overall satisfaction with life in general was established using the following standardized question: “How satisfied are you with your life in general? Very satisfied, satisfied, neither satisfied nor dissatisfied, dissatisfied, very dissatisfied.”

These various questionnaires were integrated and programmed with the help of the William software. The CIDI version used here (CIDI/Dawson) is adapted from the CIDI/CCHS 1.2 developed by Dr. Jean Caron of the Douglas Hospital Research Centre. The adjustments to this version of the interviewer-administered CIDI made the CIDI/Dawson self-administered; it also allowed the prevalence of mental health disorders measured 18 months before and 18 months after September 13, 2006, to be established¹.

Administration of the Questionnaire

The questionnaire administration room was located at Dawson College, where 25 computers were made available to the respondents. The set-up of the locale ensured the necessary privacy and offered a quiet environment for the respondent.

The students and employees were invited to participate in the study after a sustained communications campaign by the College, and the student and employee associations. This study was also presented in great detail on the College website and in the student newspaper, as well as in some daily papers in Montreal, in order to inform the parents whose children were enrolled at the College.

On site, the respondents were greeted by a research assistant. The person's eligibility was verified from the sample list; the consent form was explained, and then signed by the respondent. A psychologist or a nurse was always present in the room, in addition to the research assistant.

The CIDI/Dawson was administered by computer in the room set up for this purpose (28%) or directly on a secure website hosted by the firm MultiSpectra. The majority of respondents (97%) completed the English version of the CIDI/Dawson.

Statistical Analyses

The present study report relies on descriptive univariate, bivariate and multivariate statistical analyses. The univariate analyses allow for the description of socio-demographic and socio-medical characteristics as well as the psychological impact of the shooting, as observed in the sample. These phenomena are first presented as percentages and means. The prevalence and incidence of the mental health disorders studied are described as percentages accompanied by confidence intervals indicating the stability of these estimates. Bivariate relationships, such as the distribution of perception of physical health according to sex, are tested using the chi-square (χ^2) to compare percentages and Student's t-test to compare means.

The description of the mental disorders studied is done using multivariate analyses that allow the simultaneous consideration of the socio-demographic and socio-medical characteristics selected for this report. For example, these analyses permit establishing whether men or women are more at risk of developing a specific mental disorder while taking into consideration the fact that men and women can differ in regards to age and shooting exposure level. The statistical tool used is

1. This work was done with the help and support of the firm MultiSpectra, developer of the William software.

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logistic regression with the odds ratio to describe the strength of the association. The odds are obtained by calculating the ratio between, for example, the number of non-cases and cases of depression among men (9 non-cases for 3 cases = odds of 3), and the odds ratio is obtained by dividing the odds for men by the odds for women (4 non-cases for 2 cases = odds of 2). In this example, the odds ratio will be the ratio of both odds, i.e. $3 / 2 = 1.5$. This measure of association is also accompanied by its confidence interval, where the value of 1.0 corresponds to the absence of relationship. The significance level adopted in the present report is 0.05 unless otherwise stated.

The vast majority of respondents were students (90%), while employees made up close to 10% of the sample.

RESULTS

Socio-demographic and socio-medical characteristics

Table 1 presents the distribution of respondents according to the main socio-demographic characteristics. The vast majority of respondents were students (90%), while employees made up close to 10% of the sample. Women made up approximately 57% of the sample. There was no difference in the sex distribution according to the status of Dawson student or employee. Moreover, as was expected for the student subgroup, close to 45% of the respondents were 19 or under, while half (52%) were between 20 and 34 at the time of the shooting. The average age of students was 21.3 years. For employees, almost 90% of respondents were 35 or over, and their average age was 50.5 years. The ages of students and employees were significantly different ($t = -22.81$; $p < 0.0001$). The majority of respondents were single (84%) and close to 14% were married or were in a common-law relationships. The vast majority of students were single (91.3%), while employees were mainly married or were in a common-law relationship (66.5%). Confirming the estimate of the administration of Dawson College, the majority of respondents (78.8%) were at the College at the moment of the shooting.

When asked about their satisfaction with life, close to 7 out of 10 respondents said they were very satisfied or satisfied (68.6%). Men and women did not differ in this regard, while the level of satisfaction with life seemed higher for employees than students. The proportion of people very satisfied or satisfied with their life was 67% for students and 84% for employees taking part in the study ($\chi^2 = 21.4$; $p < 0.0001$).

A little over half of the respondents said they were in excellent or very good physical health (55%), and only 1 out of 10 people evaluated his/her physical health as average or poor (11%). Men estimated their physical health more positively than women ($\chi^2 = 16.3$; $p < 0.01$), and a similar distribution was found in College employees, who claimed a more positive perception of physical health than students ($\chi^2 = 33.9$; $p < 0.0001$).

While self-perception of mental health was not among the variables associated with the mental health disorders studied here, it is interesting to note that the majority of respondents (56%) estimated their mental health as excellent or very good, and 16% evaluated it as barely average or poor. Once again, men and employees evaluated their mental health more positively ($\chi^2 = 18.6$; $p < 0.001$ and $\chi^2 = 20.5$; $p < 0.0001$, respectively). The level of self-perception of mental health among the Dawson College population was lower than the one observed in young adults in the general population of Quebec (74%) during the CCHS 1.2 in 2002.

TABLE 1 – Socio-demographic and socio-medical characteristics of the sample (weighted data)

Characteristics	n	%
Status at Dawson		
Students	854	90.1
Employees	94	9.9
Sex		
Male	407	42.9
Female	542	57.1
Age groups (students)		
≤19	380	44.5
20 - 34	444	52.0
≥ 35	30	3.5
Marital status		
Single	772	84.4
Married	94	10.4
Common-law	32	3.5
Divorced	17	1.9
Missing data	(34)	
Presence at Dawson		
Present	727	78.8
Absent	196	21.2
Missing data	(26)	
Satisfaction with life		
Very satisfied	152	16.4
Satisfied	485	52.2
Neither satisfied nor dissatisfied	202	21.8
Dissatisfied	78	8.4
Very dissatisfied	11	1.2
Missing data	(20)	
Physical health perception		
Excellent	136	14.4
Very good	385	40.9
Good	321	34.1
Fair	84	8.9
Poor	16	1.7
Missing data	(7)	
Mental health perception		
Excellent	184	19.7
Very good	340	36.4
Good	256	27.4
Fair	120	12.8
Poor	35	3.7
Missing data	(13)	



Almost half of the respondents reported having heard gunshots without seeing the shooter, and a similar proportion said they hid with another person.

Exposure to the shooting

The Shooting Exposure Severity Scale allowed to document the shooting exposure profiles of the respondents according to their proximity to the event². Table 2 presents the various characteristics of exposure to the shooting for the respondents present at the College during the event. Note that a person could mention more than one type of exposure³.

Almost half of the respondents reported having heard gunshots without seeing the shooter, and a similar proportion said they hid with another person, either in a classroom near the Atrium (28%), in a classroom or office elsewhere in the College (36%), or in the library (36%). A substantial proportion of people present in the College (36%) said they witnessed someone being wounded or killed by the shooter. For about 20%, it was a friend or an acquaintance.

- As mentioned in the methodology section, this information was also used to obtain a continuous measure of exposure to the shooting. This issue will be addressed later.
- The average number of exposures observed with this instrument varies from 0 (13%) to 5 (2%), the average number being 2.

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13% of respondents who were inside the College said they saw the shooter.

TABLE 2 – Distribution of shooting exposure levels among respondents present at the College during the shooting (weighted data)

Type of exposure to the shooting	n	%
Wounded by the shooter	6	0.8
Witnessed someone wounded or killed by the shooter	261	35.8
Friend	27	10.6
Acquaintance	21	8.2
Family	-	-
Stranger	208	81.2
Missing data	(4)	
Saw the shooter	95	13.0
Did not see the shooter, but heard gunshots	365	50.2
Helped someone who was wounded or killed	24	3.3
Friend	6	24.0
Acquaintance	3	12.0
Family	-	-
Stranger	16	64.0
Hid alone	20	2.7
In a classroom near the Atrium	9	44.7
In a classroom or office elsewhere in the College	2	10.0
In the library	9	45.3
Hid with other people	376	51.7
In a classroom near the Atrium	103	27.5
In a classroom or office elsewhere in the College	136	36.2
In the library	136	36.2

Moreover, 13% of respondents who were inside the College said they saw the shooter. A relatively low proportion (3%) said they helped someone who was wounded or killed. Finally, the table shows that the sample includes 6 people (0.8%) who were wounded by the shooter.

TABLE 3 – Distribution of shooting exposure levels among respondents outside the College during the shooting (weighted data)

Type of Shooting Exposure	n	%
Learned that someone had died	181	92.7
Friend	13	7.6
Acquaintance	24	14.0
Family	-	-
Stranger	134	78.4
Missing data	(10)	
Learned that someone had been wounded	192	98.1
Friend	23	13.0
Acquaintance	37	20.6
Family	3	1.9
Stranger	117	64.5
Missing data	(11)	
Knew someone who was in the College or very close outside	176	90.0
Friend	133	76.1
Acquaintance	26	14.8
Family	16	9.2
Missing data	(1)	
Was very close outside	57	29.2
Heard about the shooting on the television or online	104	53.3

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The shooting exposure profile for the people who were outside the College or absent at the time of the shooting is presented in Table 3. In this group of 196 respondents, a large majority (more than 90%) learned that someone had died and that others had been wounded, and knew someone who was in the College or very close outside. The majority of respondents did not personally know Anastasia de Sousa, the student who died, but close to 20% said that Anastasia de Sousa was a friend or at least an acquaintance. Finally, a substantial proportion of respondents who were not in the College during the tragedy (53%) say they were made aware of it on the television or online.

Psychological Impact Of The Shooting

Incidence And Prevalence of Mental Disorders

The psychological impact of the exposure to the shooting was estimated with the help of a computer-assisted bilingual version of the Composite International Diagnostic Interview (CIDI/Dawson) adapted for the purposes of this investigation. Table 4 presents the incidence of the various mental disorders selected for this investigation. These are therefore new cases observed in this sample after the shooting on September 13, 2006 and do not include cases that appeared before that date. The prevalence of different disorders prior to and during the 18 months after the shooting will be reported strictly for information and will be compared to the prevalence reported for Quebec in the CCHS 1.2.

According to the results obtained with the PTSD component of the CIDI/Dawson, the incidence of PTSD associated with the shooting is 1.8%. Two additional mental disorders are noteworthy since the incidence obtained seems superior to that of PTSD. Table 4 shows that approximately 5% of the sample developed an alcohol dependency or experienced an episode of major depression. Finally, a little over 3% of the sample developed a social phobia linked to the shooting. The incidences of other mental disorders measured in this study are much lower, since they are under 1%.

When the incidence of all mental disorders considered in the study is added up, Table 4 shows that 18% of respondents developed at least one episode of one of the mental disorders during the 18 months following the shooting for the first time in their life.

There is no data on the incidence of these disorders for the general population of Quebec, but the CCHS 1.2 (Kairouz *et al.*, 2008) offers comparative data for the lifetime prevalence and prevalence during the past year, to which the Dawson data is compared. Table 4 shows that the lifetime prevalence and the prevalence in the 18 months following the event are higher among the College population for each of the mental disorders measured in these two studies.

Factors Associated With the Incidence of Mental Disorder

This section draws the first picture of the relationships observed between the four mental disorders with a high incidence (major depression episode, alcohol dependency, social phobia and posttraumatic stress disorder) and the sex, ages and shooting exposure level of the respondents. The latter variable in this case constitutes a “potentially confusing” variable. The descriptions of relationships between the sex, age, shooting exposure level and incidence of at least one studied mental disorder will also be presented. Finally, note that these results are obtained from logistic regression analyses allowing the simultaneous description of the relationships between sex, age and shooting exposure level with the mental disorders considered.

18% of respondents developed at least one episode of one of the mental disorders during the 18 months following the shooting for the first time in their life.



TABLE 4 – Prevalence and incidence of mental disorders measured in the investigation (weighted data)

Characteristics	%		CI _{95%}
Major depression episode			
Lifetime prevalence	18,2	†	15.7 – 20.7
Prevalence 18 months after the shooting	12,1		10.0 – 14.2
Incidence	5,0	*	3.5 – 6.5
Alcohol dependency			
Lifetime prevalence
Prevalence 18 months after the shooting	8,7		6.8 – 10.6
Incidence	4,7	*	3.3 – 6.1
Social phobia			
Lifetime prevalence	16,6	†	14.1 – 19.1
Prevalence 18 months after the shooting	9,6		7.6 – 11.6
Incidence	3,4	*	2.1 – 4.7
Posttraumatic stress disorder			
Lifetime prevalence	5,5		4.0 – 7.0
Prevalence 18 months after the shooting	3,4	*	2.2 – 4.6
Incidence	1,8	**	0.9 – 2.7
Illicit drug dependency			
Lifetime prevalence
Prevalence 18 months after the shooting	2,6	*	1.6 – 3.6
Incidence	0,9	**	0.3 – 1.5
Agoraphobia			
Lifetime prevalence	3,6	*	2.4 – 4.8
Prevalence 18 months after the shooting	3,0	*	1.9 – 4.1
Incidence	0,4	**	0.0 – 0.8
Panic disorder			
Lifetime prevalence	2,3	**†	1.3 – 3.3
Prevalence 18 months after the shooting	1,9	*	1.0 – 2.8
Incidence	0,3	**	0.0 – 0.7
Agoraphobia without panic disorder			
Lifetime prevalence	2,5	*	1.5 – 3.5
Prevalence 18 months after the shooting	2,1	*	1.2 – 3.0
Incidence	0,1	**	0.0 – 0.3
Presence of at least one mental disorder			
Lifetime prevalence	35,3		32.0 – 38.6
Prevalence 18 months after the shooting	30,9		27.6 – 34.1
Incidence	18,1		15.1 – 21.1

† The lifetime prevalence is significantly different than that observed in CCHS 1.2 for the general population of Quebec

* Coefficient of variation between 15% and 25%; interpret with caution

** Coefficient of variation greater than 25%; estimate given only as an indication.

Table 5 presents the significant multivariate associations between the incidence of major depression and the three selected variables. The incidence of major depression in the 18 months following the shooting is therefore almost 4 times higher in women (odds ratio = 3.9) with a greater shooting exposure (odds ratio = 1.4).

The significant statistical relationships between the variables studied and the incidence of alcohol dependency are different from the association profile observed for major depression. Here, the probability of alcohol dependency increases as the respondent's age decreases (odds ratio = 0.9), but also according to the intensity of shooting exposure (odds ratio = 1.4).

As for the incidence of social phobia, Table 5 reveals that the variables studied are not associated with the incidence of this disorder.

As reported earlier, the incidence of posttraumatic stress disorder is 1.8%. By adopting a lower significance level (90%), Table 5 suggests that women (odds ratio = 3.5) more exposed to the shooting (odds ratio = 2.1) were more at risk of developing PTSD in the 18 months following the shooting, regardless of the respondent's age.

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TABLE 5 – Factors associated with the incidence of mental disorders (weighted data)

Characteristics	Major Depression		Alcohol Dependency		Social Phobia		PTSD		All mental disorders	
	Adjusted odds ratio	CI _{95%}	Adjusted odds ratio	CI _{95%}	Adjusted odds ratio	CI _{95%}	Adjusted odds ratio	CI _{95%}	Adjusted odds ratio	CI _{95%}
Sex Female Male *	3.93	1.74 – 8.92					3.54	1.19 – 10.55	1.59	1.03 – 2.46
Age			0.85	0.73 – 0.99					0.92	0.88 – 0.96
Level of exposure	1.44	1.06 – 1.97	1.44	1.05 – 1.98			2.12	1.40 – 3.23	1.53	1.25 – 1.89

* Reference category.

When all the mental disorders measured in the investigation are taken into consideration (disorders presented in Table 4), the multivariate analyses show that the youngest women most exposed to the September 13 2006 shooting were more at risk of developing at least one of these mental disorders.

Intensity of posttraumatic distress

The intensity of posttraumatic distress during the month before the data gathering as measured with the PCL-S allows for an estimate of the posttraumatic distress level during the 18th month after the shooting. The PCL-S analysis shows that the average distress score recorded in the sample is 25.1 (CI_{95%} 24.4 – 25.9).

The respondents who developed PTSD linked to the shooting had an average posttraumatic distress index of 45.0, compared to 24.5 for people who did not develop PTSD after the shooting ($p < 0.001$). Female respondents received an average PCL-S (26.4) slightly greater than that of males (23.4; $p < 0.0001$), and students had an average posttraumatic distress score (25.4) greater than that of employees (22.8; $p < 0.001$).

Taking into consideration the significance level corresponding to a severe level of posttraumatic stress on the PCL-S scale (index of 44 or more), the study data allow to conclude that 7.1% of respondents (CI_{95%} 5.3 – 8.9) still showed important signs of distress 18 months after the shooting exposure. No significant difference could be observed according to sex or student/staff member status.

Table 6 shows that the risk of severe posttraumatic distress is greater in respondents of both sexes who are young (odds ratio = 0.9) with a higher exposure level (odds ratio = 1.7).

TABLE 6 – Significant factors associated to the severity of posttraumatic distress according to the PCL-S (n = 770; weighted data)

Characteristics	Adjusted odds ratio	CI _{95%}
Sex Femal Male*		
Age	0.90	0.83 – 0.98
Exposure level	1.74	1.32 – 2.30

* Reference category.

7.1% of respondents still showed important signs of distress 18 months after the shooting exposure.

The lifetime prevalence of suicidal ideations is significantly higher in the Dawson College sample than for the general population of Quebec.

Suicidality

Beyond the risk of developing various anxiety and affective disorders as well as drug and alcohol dependency, the distress caused by such an event could even cause the emergence of serious suicidal ideations which can lead to suicide attempts.

Table 7 indicates that suicidal ideations and suicide attempts can occur outside of a traumatic event such as a shooting. One out of five respondents actually reported having had serious suicidal ideations during his/her life, while for the same period, almost 3% of the sample revealed having made a suicide attempt of various degrees of severity.

When compared to the Quebec results of the Canadian Community Health Survey (Cycle 1.2) (CCHS 1.2) (Kairouz, *et al.*, 2008), the lifetime prevalence of suicidal ideations is significantly higher in the Dawson College sample (21.8%; CI_{95%} 19.0 – 24.6) than for the general population of Quebec of 2002 (14.4 %; CI_{95%} 13.0 – 15.8). Nonetheless, the lifetime prevalence of suicide attempts does not differ.

However, when considering the 18-month post-shooting period, 7% of respondents had seriously thought about suicide and almost 1% said they had made a suicide attempt. The prevalence of suicidal ideations is significantly higher than that observed in the CCHS 1.2 (3.8 %; CI_{95%} 2.9 – 4.8)⁴. Moreover, suicidality estimated during the study's post-shooting period made up almost one third of all suicidality experienced by the respondents during their lifetime.

The results presented in Table 8 allow to establish that these forms of suicidality are associated with the development of posttraumatic stress disorder. The incidence of posttraumatic stress disorder after the September 13, 2006 shooting seems to increase the probability of the emergence of suicidal ideations (25.0 %; $p = 0.04$) and suicide attempts (16.7 %; $p = 0.005$).

TABLE 7 – Prevalence and incidence of suicidal ideations and suicide attempts (weighted data).

Characteristics	%	CI _{95%}
Suicidal ideations		
Lifetime	21.8	19.0 – 24.6
Last 18 months	6.6	4.9 – 8.3
Suicide attempt		
Lifetime	2.6*	1.5 – 3.7
Last 18 months	0.9**	0.3 – 1.5

* Coefficient of variation between 15% and 25%; interpret with caution.

** Coefficient of variation greater than 25%; estimate given only as an indication.

TABLE 8 – Incidence of suicidal ideations according to the presence of posttraumatic stress disorder (weighted data)

Characteristics	Suicidal ideations		Suicide attempt	
	%	Fisher's exact test	%	Fisher's exact test
PTSD				
Absent	6.2	0.036	0.7	0.005
Present	25.0		16.7	

4. Note, however, that the CCHS covers the last 12 months, while the present study covers the last 18 months.

Use of services

One of the objectives of the study was to evaluate the use of services by focusing on the pattern of service use after September 13, 2006.

Table 9 presents the resources used after the shooting. It differentiates the total level of use during that period (prevalence) from the first lifetime use that is associated with the shooting (incidence). Close to one in four respondents (23%) has used one of the resources mentioned in Table 9. Moreover, 13% of respondents have consulted at least one mental health professional: a psychiatrist (5.8%), a general practitioner (6.6%) or a psychologist (6.6%). The rates at which these professionals were consulted do not differ significantly.

It is important to note that more than 14% of the respondents report having used the Internet to investigate mental health issues during the post-shooting period.

Taking into consideration all professional resources, Table 9 shows that more than 5% of the Dawson population consulted de novo (for the first time in their life) a service provider or a point of service after September 13, 2006. Since 13% consulted these service providers or points of service at least once since September 13, 2006, this implies that 8% of the Dawson population that consulted after September 13, 2006 had consulted before.

TABLE 9 – Prevalence and incidence of use of various resources since September 13, 2006 for the Dawson population

Resources used	Prevalence After September 13, 2006		Incidence	
	%	CI _{95%}	%	CI _{95%}
Psychiatrist	5.8	4.2 – 7.4	1.9	1.0 – 2.8
General practitioner	6.6	4.9 – 8.3	2.5	1.4 – 3.6
Psychologist	6.6	4.9 – 8.3	2.0	1.1 – 2.9
At least one of these professionals	13.0	0.7 – 15.3	5.0*	3.5 – 6.5
Counsellor for alcohol or drug abuse	0.4**	0.0 – 0.8	0.2**	0.0 – 0.5
Other professional or responder	1.3**	0,5 – 2,1	***	***
Hospitalization	0.5**	0.0 – 0.0	0.4**	0.0 – 0.8
In-patient stay	0.3**	0.0 – 0.7	0.2**	0.0 – 0.5
At least one of these professional resources	13.2	10.9 – 15.5	5.3	3.8 – 6.8
Religious or spiritual counsellor	1.0**	0.3 – 1.7	0.3**	0.0 – 0.7
Internet	14.1	1.7 – 16.5	***	***
Phone line	0.9**	0.3 – 1.5	***	***
Help group	1.0**	0.3 – 1.7	***	***
At least one of these other resources	5.7	13.2 – 18.2	0.3**	0.0 – 0.7
At least one of the 11 resources listed	23.0	20.1 – 25.9	5.4	3.8 – 7.0

* Coefficient of variation between 15% and 25%; interpret with caution.

** Coefficient of variation greater than 25%; estimate given only as an indication.

*** Not applicable, information not available.

13% of respondents have consulted at least one mental health professional.

14% of the respondents report having used the Internet to investigate mental health issues during the post-shooting period.

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When compared to the use of resources for mental health purposes as reported in the Canadian Community Health Survey, Cycle 1.2 in 2002 (CCHS 1.2) (Lesage *et al.*, 2008), which had asked exactly the same questions on the use of services for mental health purposes in the general Canadian population, and here in Quebec differences appear. In total, 9% of the population had used at least one resource in the healthcare system, which is slightly less than in the Dawson population after September 13, but is at the threshold of a significant difference. However, when all resources used are considered, i.e. close to 10% in the CCHS 1.2 investigation in 2002, the difference is significant compared to the 23% reported after September 13, 2006 by the Dawson respondents. This is essentially due to the extensive use of the Internet for information purposes, which was reported only by less than 0.5% in the CCHS 1.2 investigation a few years earlier.

FIGURE 1 - Prevalence of use of various resources since September 13, 2006 according to sex and student/employee status at Dawson College

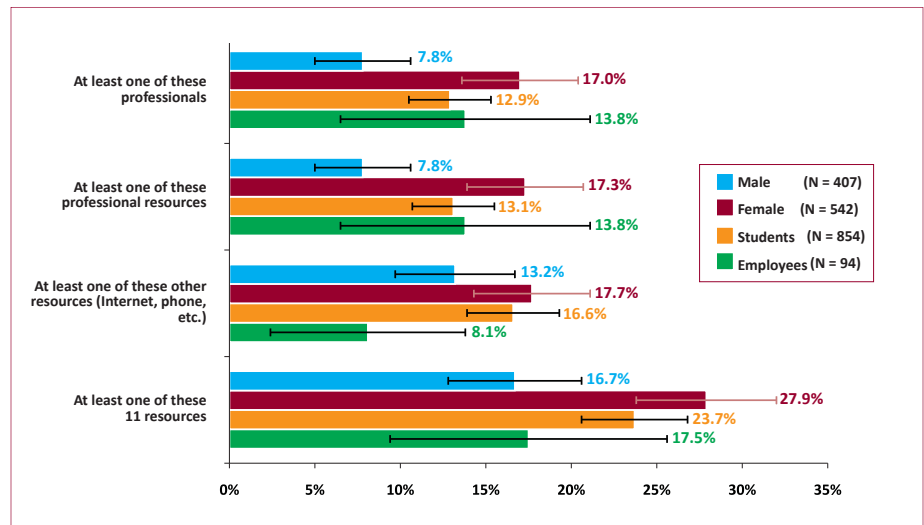
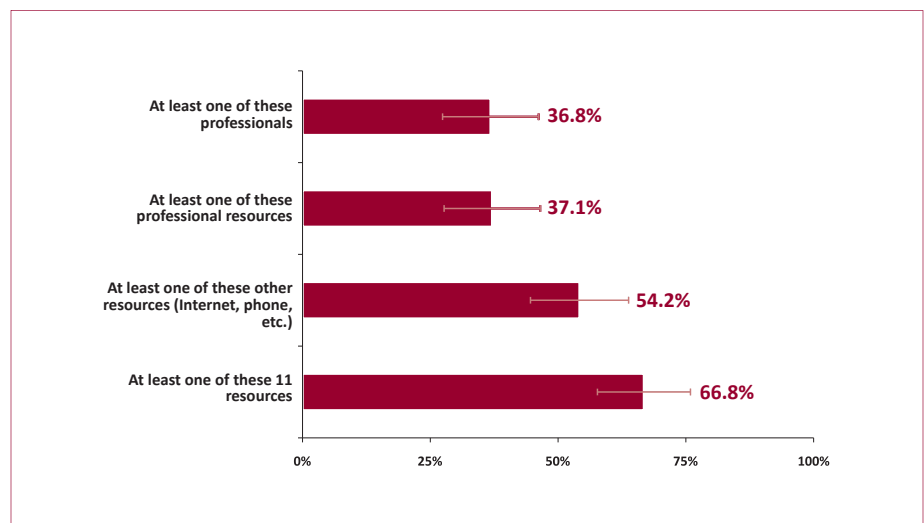


Figure 1 shows that the consultation models vary substantially according to the sex and student/employee status at Dawson College. When taking into consideration all 11 resources mentioned, women (28%) consult more than men (17%). This difference persists when all professional resources are considered. Women consult almost twice as often as men. Finally, the graph shows that comparatively to College employees, students use more the “other resources” (8% vs. 17%). The use of the Internet explains most of this phenomenon.

FIGURE 2 - Prevalence of use of at least one type of resource used AFTER September 13, 2006 by respondents having at least a diagnosis of depressive or posttraumatic stress episode



Women (28%)
consult more than
men (17%).

In order to evaluate the response to needs, it is important to verify the level of use of services for people suffering from a mental disorder. Firstly, the use of services by people having at least one diagnosis of depressive or posttraumatic stress episode was defined (Figure 2). The graph shows that two-thirds of people with a depressive episode or PTSD have used one of the resources studied. A little over one-third of people with one of these diagnoses said they had consulted a healthcare professional (psychiatrist, psychologist or general practitioner). Another third of respondents consulted at least one of the other professional resources. Finally, the Internet, phone lines and other similar resources were used by more than 50% of people with at least one of the two diagnoses. In the CCHS 1.2 in Quebec (Lesage *et al.*, 2008), 49% of people with depression and 21% of those with an anxiety disorder had consulted healthcare professionals. The same proportion is observed among students and employees, when considering a lower utilization of professional healthcare services by young people making up more than 90% of the respondents.

As to the level of satisfaction with the services received, 84% of people having consulted at least one resource felt that at least one service was satisfactory; 22% received at least one service they felt was unsatisfactory; but close to half felt they would have required an additional service.

The most accurate interpretation is that the majority of people who had a mental health problem did not consult a professional; when they did consult, people were satisfied with the services received, rarely dissatisfied, but the majority would have needed additional services.

The main reason for not consulting given by people who had at least one mental health problem since September 13, 2006 and who received or wanted to receive at least one service is that they preferred to “figure things out on their own”. In this regard, the respondents of this investigation do not differ from those of the CCHS 1.2 (Quebec) of 2002, where the majority of people with mental disorders did not consult. The main reason given for not using services was therefore one of acceptability rather than accessibility (Lesage *et al.*, 2008).



84% of people having consulted at least one resource felt that at least one service was satisfactory.



DISCUSSION

The epidemiological investigation conducted at Dawson College following the September 13, 2006 shooting is ground-breaking. The College administration wanted to evaluate the psychological impact of the tragic event on its students and employees, especially since the College authorities had no published report or study to draw from, even after more than 30 fatal school shootings in the past 20 years.

The literature review reveals that very little is known about the psychological repercussions, mainly posttraumatic stress disorder (PTSD), of such events in a school, work or other settings. Moreover, the epidemiological importance of PTSD among the Canadian and Quebec population is still not very well understood.

The Van Ameringen et al. study (2002) is the only one to have measured this phenomenon in Canada using solid methodology. That investigation reveals that 76% of the Canadian population reports one form or another of traumatic exposure. Also, 16% of Canadians said that they had been threatened with a weapon, and 32% had witnessed a murder, a death or a serious accident. Moreover, 17% of respondents said they learned that people very close to them had experienced an important trauma, and 40% reported an unexpected death among their family and friends. For all the traumatic exposures experienced, Van Ameringen's team reports a lifetime PTSD prevalence of 9.2% and a PTSD prevalence during the last month of 2.4%.

Van Ameringen et al. identified the traumatic events most associated to lifetime PTSD prevalence. Among those of interest to this study, being threatened with a weapon and witnessing a murder, death or serious accident account for 3% and 9% respectively, of lifetime PTSD cases. The occurrence of an important trauma to family members or friends explains 3% of PTSD cases. It is important to note that the unexpected death of a loved one alone explains 30% of all lifetime PTSD cases according to Van Ameringen. Finally, the results of that research indicate that single women living in rural areas are the most at risk of developing PTSD. The Quebec population is no more or less at risk of developing PTSD than other parts of Canada.

The present study also distinguishes itself by the focus it places on the identification of other anxiety and depressive disorders as well as disorders linked to psychoactive substances. Very few posttraumatic studies have taken these other disorders into consideration as well as having access to recent comparative data for the population with the same validated instruments (CCHS 1.2). In addition to estimating the incidence of PTSD, the present study made possible the observation of an increased prevalence of most other anxiety and affective disorders, as well as disorders linked to substance abuse.

The use of services and the perception of the state of mental health were measured with the same instruments as those used in the CCHS 1.2. This methodological choice allowed the observation, among the College population, of a pattern of use of professional services comparable to that of the general population of Quebec and underscores the extensive use of the Internet. The research team innovated by creating an instrument developed specifically for the Dawson shooting, which shows that the greater the traumatic exposure, the higher the risk of PTSD, suicidal ideations and other disorders.

Limitations of the Study

The present study demonstrates some limitations that need to be taken into consideration when interpreting the results. The main one, as mentioned in the methodology section, is the impossibility of empirically confirming the representativeness of the sample. This difficulty is not explained by a lack of diligence in the random selection of the study participants, but by a low rate of participation among the population of reference. According to the College administration, this rate is mostly due to the fact that the data gathering was conducted at the end of the semester and that both students and employees were otherwise busy. Moreover, some people suggested that many did not wish to revisit the tragic event more than 18 months later; that they simply wanted to move on.

It is very difficult to estimate the impact of non-representativeness of the sample on the estimates of the psychological impact of the shooting. Certain factors of non-participation can skew the data

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into an overestimation⁵ of the incidence, while others might create an underestimation⁶ of the psychological impact. In the best of cases, these effects cancel each other out.

The comparisons of lifetime PTSD prevalence (5.5%; $CI_{95\%}=4.0-7.0$) and the PTSD prevalence in the last 18 months (3.4 %; $CI_{95\%}=2.2-4.6$) estimated at Dawson College with those reported in the Van Ameringen et al. study (2002) for a lifetime (9.2%) or the last month (2.4%) suggest that the estimates of prevalence and incidence of PTSD obtained in the study are consistent with those observed in the Canadian population when exposed to a potentially traumatic event.

Strengths of the Study

Nonetheless, this research project entails a heretofore unrivalled methodology for this type of investigation in a school environment:

- use of the Composite International Diagnostic Interview (CIDI/Dawson) allowing for the estimation of prevalence and incidence of the main mental disorders, not only that of PTSD;
- use of the English and French computer-assisted versions of the CIDI/Dawson, administered in a classroom or online;
- use of a Shooting Exposure Severity Scale specifically designed for the Dawson College shooting;
- measure of the incidence of suicidal ideations and suicide attempts;
- measure of the use of services for all services offered in the community;
- use of multivariate analyses allowing for the simultaneously consideration of more than one risk factor.

It is also important to note that the research protocol was developed in close collaboration with clinical first responders and the Dawson College administration, and that the research is part of an effort to better understand the impact of the event, the short- and long-term interventions following the event, and also contribute to the elaboration of a multimodal psychological intervention plan after a school shooting.

The research protocol was developed in close collaboration with clinical first responders and the Dawson College administration.

5. For example, the greater participation of people who were psychologically affected.

6. For example, the difficulty in reaching students exposed to the shooting but no longer at Dawson during the investigation.

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