

## The Physical and Mental Health of Incarcerated Persons: A Canadian Perspective



Colin Henning<sup>a\*</sup>

<sup>a</sup> *Department of Applied Modelling and Quantitative Methods, Trent University, 1600 West Bank Drive, Peterborough, K9J 0G2, Ontario, Canada*

*\*Correspondence to: colinhenning@trentu.ca*

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### Abstract

There is a growing body of research examining the physical and mental health status of persons incarcerated in Canada. However, in comparison to research conducted in other countries around the world, research on persons incarcerated in Canada remains limited. There is also a lack of literature reviews that provide a broad and comprehensive examination of research on both physical and mental health conditions experienced by incarcerated person in Canada and the wellness programming designed to manage these conditions. The purpose of this literature review is to provide a broad overview of the relevant literature from a variety of sources, taking a multidisciplinary approach to examining the health of incarcerated persons in Canada and the effectiveness of wellness programs designed for this population. Overall, the current literature demonstrates incarcerated persons in Canada experience a wide variety of both physical and mental health conditions at higher rates than found in the general population, including acute and chronic physical health conditions, mental health disorders, and suicide. In particular, current research suggests older individuals and Indigenous peoples incarcerated in Canada face an even greater health burden than the general prison population. Encouraging, however, is the reviewed literature demonstrating the effectiveness of a variety of wellness programs implemented with incarcerated persons, including physical exercise and education programs. To encourage further work in this area, the present literature review ends with a discussion of recommendations for future wellness programs and the research work conducted to evaluate them.

**Keywords:** *Canada, Health, Incarceration, Wellness Programs, Literature Review*

### Introduction

According to the World Health Brief, more than 11 million individuals are currently incarcerated in prison systems around the world, and since the year 2000, the world's incarcerated population has grown by approximately 24% (Walmsely, 2018). Rates of prison population growth vary greatly between countries. In Canada, approximately 38 786 individuals are incarcerated on any

given day (Malakieh, 2019). Of those incarcerated in Canada, 14 129 individuals are in federal custody while another 24 657 individuals are in provincial or territorial custody. Moreover, recent data has also indicated that the world incarceration rate is approximately 145 individuals per 100 000 (Walmsley, 2018). Incarceration rates also vary greatly between countries, with the largest

incarceration rate found in the United States at a rate of 655 individuals per 100 000 (Walmsely, 2018). Recent data also suggests that, in many jurisdictions around the world, incarceration rates have been steadily increasing. However, over the last several years, incarceration rates across Canada have been slightly decreasing along with the national crime rate (Malakieh, 2019; Public Safety Canada, 2018). Indeed, Canada's incarceration rate during 2018 was 131 adults per 100,000: a decrease of 4% from the incarceration rate during 2017 (Malakieh, 2019).

Despite this slight decrease in Canada's incarceration rate, prison health remains of substantial concern for researchers, health care professionals, and community and government organizations (John Howard Society of Ontario [JHSO], 2016; Kouyoumdjian et al., 2016; Office of the Correctional Investigator, 2018; Simpson, McMaster, & Cohen, 2013). Within the broader prison research literature, evidence points to a number of consequences following incarceration, including the disproportionate health care needs of incarcerated persons (Kouyoumdjian et al., 2016). For instance, the Correctional Investigator of Canada identified in his 2018 annual report that the most common complaints reported by incarcerated persons are regarding health and health care (Office of the Correctional Investigator, 2018). Despite this, little research attention to date has focused on the specific physical and mental health concerns of incarcerated individuals within Canada. Indeed, there are few examples of comprehensive reviews that provide researchers, governments, and the general public with evidence of the current status of physical and mental health among individuals in the Canadian prison system. To the author's knowledge, only one such review conducted by Kouyoumdjian et al. (2016) demonstrates an attempt to broadly outline the physical and mental health of prisoners in Canada.

However, this review is also limited in its scope and coverage of physical and mental health among incarcerated persons in Canada, in particular in its neglect of current research demonstrating the effectiveness of health and wellness programs designed and implemented in the prison context.

With this in mind, the purpose of this literature review is to provide a broad overview of the physical and mental health status of incarcerated persons, while focusing on the Canadian context. To do this, the present literature review will adopt a multidisciplinary approach by providing evidence from a variety of scholarly and non-scholarly sources, including research from medical science, psychology, forensic science, as well as government and non-profit organizations. In particular, given the disproportionate representation of Indigenous peoples in Canadian prisons (Office of the Correctional Investigator, 2018), this review will take advantage of the present literature regarding the health of incarcerated Indigenous peoples in Canada to give specific attention to the physical and mental health status of Indigenous peoples in Canada's prison system. Along with a review of the health needs of incarcerated persons, this literature review will also provide a brief overview of the growing research literature regarding the effectiveness of health and wellness programming implemented in the prison context. Finally, this literature review will identify and outline a number of recommendations for future prison-based health and wellness programs in order to inform future work in this area.

### **Physical Health of Incarcerated Persons**

Within the area of prison research, both in Canada and globally, it has become clear that incarcerated persons experience a higher prevalence of a variety of physical health conditions, both during incarceration and following release (JHSO, 2016; Massoglia &

Remster, 2019; Massoglia & Pridemore, 2015). More extensive research has been conducted in the U.S. (Massoglia & Remster, 2019; Massoglia & Pridemore, 2015), however a growing body of research has begun to demonstrate the physical health needs of individuals in both federal and provincial prisons in Canada (JHSO, 2016; Kouyoumdjian et al., 2016).

### **Acute Health Conditions and Mortality**

*Acute disorders:* According to recent data, approximately 34% of men in federal prison have reported experiencing a head injury (JHSO, 2016), with an estimated 41.2-51.1% of incarcerated persons having experienced a traumatic brain injury (TBI), either prior to or during incarceration (Farrer and Hedges, 2011). These rates of head injury and TBI are higher than the estimated rates for the general population (Farrer & Hedges, 2011; JHSO, 2016), and overall, they underline the broader finding that individuals are generally at a higher risk for physical assault during incarceration, both from other individuals in prison and from correctional staff (Fazel et al., 2016). Beyond head trauma, research has found incarcerated young men report greater acute physical discomfort and higher rates of acute disorders, including higher rates of both minor acute disorders (e.g., colds and sprains) and major acute disorders (e.g., pneumonia and broken bones) (Forrest et al., 2000).

*Mortality:* Evidence also suggests that incarcerated persons in Canada, and around the world, have higher mortality rates than the general population (Kouyoumdjian et al., 2016; Kouyoumdjian, Andreev et al., 2017; Kouyoumdjian, Pivnick et al., 2017). Mortality rates for men in Ontario prisons are significantly higher than mortality rates for the general Ontario population across all age groups, with similar findings for women (Kouyoumdjian, Andreev et al., 2017). For

incarcerated men and women, life expectancies are also significantly lower compared to the general population, with incarcerated individuals 20-24 years old having death rates similar to individuals 25 years older in the general population. In particular, recent data shows the overall cancer-specific mortality rate alone among incarcerated individuals in Ontario is 1 adult per 1000 for men and 0.8 adults per 1000 for women (Kouyoumdjian, Pivnick et al., 2017). Moreover, the incidence rate for any new cancer among men is 1.0 and for women 0.9 compared to the general population (Kouyoumdjian, Pivnick et al., 2017). Among incarcerated men, the most common forms of cancer are lung, prostate, colorectal, and head and neck cancer, while for women the most common forms of cancer were breast, lung, and cervical cancer.

### **Nutrition and Dietary Health**

One relatively underexamined areas of concern regarding the health of incarcerated populations is their dietary intake and nutritional health (Collins & Thompson, 2012; Johnson, Chaput, Rioux et al., 2018). Recent qualitative studies have highlighted reports from individuals in Canadian prisons that poor food quality and lack of education and skills regarding food choice and nutrition are a significant concern (Davison, D'Andreamatteo, & Smye, 2019; Vail et al., 2017; Wangmo et al., 2018). Similarly, Hadden et al. (2018) empirically examined the health literacy of recently released U.S. inmates and found that 60% of inmates had inadequate health literacy.

Consistent with these findings, recent research found that 64.4% of individuals in U.S. prisons were vitamin D deficient, with rates of deficiency increasing with longer prison stays (Jacobs & Mullany, 2015). Approximately 37.6% of individuals incarcerated for less than 6 weeks were classified as vitamin D deficient, while 90% of

inmates incarcerated for over a year were vitamin D deficient. Similarly, a study conducted in South Carolina found that incarcerated individuals consumed higher than recommended levels of cholesterol, sodium, and sugar, as well as lower than recommended levels of fiber, magnesium, potassium, vitamin D, and vitamin E (Collins & Thompson, 2012).

Despite limited research on the topic, current studies have similarly found the nutritional and dietary health of individuals incarcerated in Canada to be of concern. For instance, Johnson, Chaput, Rioux et al. (2018) found that inmates who gained the most weight in prison reported not eating vegetables, while those who gained less weight during incarceration reported eating vegetables more than 3 times per day as well as eating fruit, cereal, dairy, and legumes regularly. Individuals who reported limiting their intake of non-nutritious high calorie foods also showed less weight gain. Thus, current evidence, while limited in the Canadian context, points to poor nutritional health among incarcerated individuals, likely owing to a lack of both nutritional health literacy and a lack of skills regarding dietary management (Collins & Thompson, 2012; Davison, D'Andreamatteo, & Smye, 2019; Hadden et al., 2018; Jacobs & Mullany, 2015; Johnson, Chaput, Rioux et al., 2018, Vail et al., 2017; Wangmo et al., 2018).

### **Chronic Health Conditions**

Growing evidence from the prison literature has demonstrated higher rates of chronic health conditions among incarcerated populations (JHSO, 2016; Kouyoumdjian et al., 2016; Johnson, Chaput, Diasparra et al., 2018). Indeed, according to the John Howard Society of Ontario (2016), over 6% of men in federal prison have diabetes, while over 6% have urological conditions, and over 19% have chronic back pain.

*Communicable diseases:* Hepatitis C and HIV/AIDS are also common among Canadians in federal prison and occur at higher rates than among the general population (Kouyoumdjian et al., 2016). Approximately 30% of individuals in federal prison are infected with hepatitis C, while approximately 1-2% of men in federal prison are infected with HIV/AIDS. This means that the rate of HIV infection among Canada's incarcerated population is 7-10 times higher than that of the general Canadian population (JHSO, 2016). Tuberculosis (TB) is similarly common among Canadians in federal prison and presents at a higher rate than that found in the general population. In particular, the rate of TB infection is estimated at 22.4 active cases per 100 000 in the Canadian prison system (Kouyoumdjian et al., 2016). The estimated prevalence of STIs, including chlamydia, gonorrhoea, and syphilis, is also high among incarcerated populations (Kouyoumdjian et al., 2012). For chlamydia, overall prevalence is 7.81% of individuals, for gonorrhoea 2.38%, and for syphilis the overall prevalence is 2.12%, with women in prison having higher infection rates of all three STIs than men.

*Respiratory and cardiovascular conditions:* Among Canadians in federal prison, approximately 20% have cardiovascular conditions, 15% having respiratory conditions, 14% having asthma, and over 8% having hypertension (JHSO, 2016). Research has found consistent evidence for higher rates of cardiovascular disease among individuals with a history of incarceration, as well as higher rates of cardiovascular risk factors such as hypertension, diabetes, asthma, kidney-related problems, stroke, obesity, and dyslipidemia (Wang et al., 2017). Moreover, Wang et al. (2017) have reported that incarcerated individuals have a higher rate of mortality due to cardiovascular disease and are at a higher risk of hospitalization due to heart-related problems.

*Obesity and weight gain:* A growing body of research has also found consistent evidence that incarcerated populations have higher rates of obesity and overweight, as well as higher rates of weight gain than the general population (Baldwin, Roberts, & Clark, 2016; Johnson, Chaput, Diasparra et al., 2018; Wolff et al., 2012). Among individuals in Canadian federal prisons, one study found that, on admission, 66% of inmates were overweight or obese compared to 61.3% in the general population (Johnson, Chaput, Diasparra et al., 2018). However, during incarceration, researchers found that the prevalence of overweight or obesity increased to 84.2% (an increase of 27.6% from admission) by the end of the study. Individuals in prison experienced an average annual weight gain of 1.5kg per year, with individuals between the ages of 45-64 gaining the most weight overall (7.5 kg) and younger individuals between the ages of 18-24 experiencing the most rapid weight gain (3.5kg/year). Of particular interest, federally incarcerated individuals in Ontario reportedly gained more weight during incarceration than those federally incarcerated in Atlantic provinces, suggesting regional differences in the physical health status of incarcerated persons in Canada (Johnson, Chaput, Diasparra et al., 2018).

*Aging and chronic conditions:* Similar to the general population of Canada, researchers and government organizations have recently reported a shift towards an aging prison population in Canada (Office of the Correctional Investigator, 2019). Indeed, approximately 25.2% of individuals in federal prison in Canada are 50 years old or older, and the average age of federal offenders has been gradually increasing over the last decade, with the average age of federal offenders currently at age 40 (Office of the Correctional Investigator, 2019). Given this trend, it is important to consider the chronic health concerns of older adults in incarceration. In particular, a recent report by the Office of the

Correctional Investigator of Canada (2019) has indicated that prevalence rates of chronic diseases among inmates 65 years old or older are not only higher than those in the general population, but also higher than rates among their incarcerated younger peers. Older individuals in prison are more likely to suffer from a variety of chronic health conditions, including hypertension, diabetes, liver disease, arthritis, cancer, and heart conditions, compared to their younger peers (Skarupski et al., 2018). The most common chronic diseases among federally incarcerated individuals 65 or older being obesity, hypertension, high cholesterol, type 2 diabetes, and chronic pain (Office of the Correctional Investigator, 2019).

### **Health Care Use**

Along with the physical health conditions experienced by incarcerated populations, research has found that incarcerated persons use health care at a higher rate, both during and after incarceration (Kouyoumdjian, Cheng, Fung, Humphreys-Mahaffey et al., 2018; Kouyoumdjian, Cheng, Fung, Orkin et al., 2018). Recently released individuals in Ontario were found to have higher rates of primary health care utilization while in prison and up to 180 days post-release compared to the general population (Kouyoumdjian, Cheng, Fung, Humphreys-Mahaffey et al., 2018). Moreover, compared to the general population, rates of ambulatory care use, emergency department use, medical-surgical hospitalization, and psychiatric hospitalization, are higher among incarcerated persons in Canada (Kouyoumdjian, Cheng, Fung, Orkin et al., 2018). Relative to their time in prison, rates of emergency department use, medical-surgical hospitalization, and psychiatric hospitalization also increase among former incarcerated individuals during the week following their release, indicating a critical period of physical health care need following release from prison (Kouyoumdjian, Cheng, Fung, Orkin et al., 2018).

## Physical Health and Wellness Programs

Overall, it is clear from the literature that a variety of physical health needs are disproportionately experienced by persons incarcerated in Canada. Unfortunately, despite this identified need, the existing literature regarding health and wellness programs designed to target physical health problems among incarcerated populations is limited. Currently, a majority of the research in this area has been conducted in the U.S. and emphasizes nutrition-based programming, physical exercise-based programming, or a combination of the two (Curd et al., 2013; Elwood Martin et al., 2013; Firth et al., 2015; Johnson et al., 2019; Nair et al., 2016). Despite these limitations, however, much of the current literature shows encouraging results.

Curd, Ohlmann, and Bush (2013) examined the effectiveness of a year long nutrition workshop program implemented in a U.S. correctional facility. The evaluated wellness program involved three workshops, each consisting of four to five weekly 90-minute sessions in a classroom setting. Each session involved a lecture and discussion style format where material on nutritional requirements and associated handouts were discussed openly. Researchers found that participation in the wellness program led to significant improvements in reported nutrition practices as well as improved general physical health as compared to individuals in a control group. Similarly, Johnson et al. (2019) recently evaluated the influence of physical activity on the body weights of individuals during incarceration in Canada and found that the proportion of individuals with “high risk” BMIs and waist circumferences was significantly lower when individuals engaged in physical activity for more than 30 minutes per day. Further, more intense physical exercise was associated with lower BMIs than less intensity exercise, and more time spent

engaged in physical activity was associated with less weight gain (Johnson et al., 2019).

In a unique participatory research program that involved incarcerated women in the designing and implementation of a wellness program in a Canadian provincial women’s prison, researchers evaluated a 6-week pilot wellness program (Elwood Martin et al., 2013). The program consisted of a nutritional component, including a personalized food chart that allowed for self-monitoring of food intake, as well as a fitness component, including options for either the development of an individualized exercise plan or group cycling classes designed for various fitness levels. Researchers found participants in this program had decreased waist-to-hip ratios, decreased chest measurements, reductions in weight and BMI, and self-reported improvements in energy levels, sleep, and stress. In qualitative interviews, individuals also reported decreases in body pain, reduce drug cravings while doing regular exercise, and improved mental health due to social support from the group exercise classes (Elwood Martin et al., 2013).

## Mental Health of Incarcerated Persons

Beyond physical health, incarcerated persons in Canada also experience a higher prevalence of mental health problems (Fazel et al., 2016; JHSO, 2016; Kouyoumdjian et al., 2016; Simpson et al., 2013). Evidence from studies examining the mental health of individuals incarcerated in Canada, and around the world, have found consistently higher rates of mental health problems among incarcerated populations (Fazel et al, 2016; Gottfried & Christopher, 2017; Kouyoumdjian et al., 2016; Simpson et al., 2013).

## Prevalence of Mental Health Disorders and Symptoms

In the U.S., one study found that 23.3% of individuals on probation screened positive for a substance use disorder (SUD), 13% for an anxiety disorder, 41.6% for bipolar disorder, and 16.8% for major depressive disorder (MDD) (Cardarelli et al., 2015). In Canada, 41.1% of persons incarcerated in an Ontario prison reported severe symptoms of a mental health problem, with 28.1% reporting at least one current severe symptom and 13% reporting two or more severe symptoms (Brown, Hirdes, & Fries, 2015). Women in prison were more likely to have current, severe mental health symptoms than men (Brown et al., 2015), and older individuals in prison were more likely to have mental health problems, including higher rates of dementia, depressive disorders, anxiety disorders, and personality disorders, than younger individuals (Brown et al., 2015; Office of the Correctional Investigator, 2019).

Overall, rates of mental health problems are 2-3 times higher among incarcerated persons in Canada than in the general population (JHSO, 2016). Importantly, research has found that incarcerated men suffer from MDD at a higher rate than non-incarcerated men, even when controlling for predisposing factors, such as childhood adversity, prior depression, delinquency, and drug use prior to incarceration (Edgemon & Clay-Warner, 2019). Additionally, evidence suggests that conditions of incarceration, including overcrowding, lack of family interactions, and inmate boredom (e.g., lack of work assignments and recreational activities), are associated with greater depression, hostility, and poorer overall psychological well-being (Edgemon and Clay-Warner, 2019).

## Substance Use and Other Risky Health Behaviours

Individuals in prison also engage in higher rates of risky health behaviours, such as substance use and risky sexual behaviour (Chamberlain et al., 2019; Fazel et al., 2016; Gates et al., 2017; JHSO, 2016; Kouyoumdjian et al., 2014; Rogerson, Jacups, & Caltabiano, 2016).

*Substance use:* Among Indigenous individuals incarcerated in Australia, researchers found that 70% had used cannabis within three months of incarceration, of whom 64.3% met criteria for cannabis dependence and were five times more likely to be at risk for impaired psychological well-being. In the U.S., a study found 45% of individuals recently released from prison had been diagnosed with an SUD, 18% reported illicit substance use, and 23% reported alcohol use shortly after release (Chamberlain et al., 2019). In Canada, 56.6% of individuals recently incarcerated in an Ontario provincial prison reported illicit substance use in the past year, 21.6% of whom reported injection drug use (Kouyoumdjian et al., 2014). Overall, current research provides consistent evidence that incarcerated populations have a higher prevalence of SUDs than the general population (Gates et al., 2017). The majority of incarcerated persons, 60.3-80%, have a history of SUD (Gates et al., 2017; JHSO, 2016), with approximately 68.2% diagnosed with at least one SUD and approximately 53.8% diagnosed with two or more SUDs. SUDs are also more common among incarcerated men than women and are more common among younger than older individuals in prison (Gates et al., 2017).

*Risky sexual behaviour:* In addition to higher rates of substance use, incarcerated individuals engage in risky sexual behaviours at higher rates than in the general population (Kouyoumdjian et al., 2014). Research among men in an Ontario provincial prison found that

47% of individuals reported having multiple sexual partners in the past year, prior to incarceration. Moreover, 71% reported having sex while intoxicated, 77.4% reported having unprotected sex, and 56.6% reported never having used a condom in the past year.

### **Suicide Risk and Self-Injurious Behaviour**

Along with other mental health problems, researchers have highlighted the higher prevalence and risk for suicide among incarcerated populations (Cardarelli et al., 2015; Gunter et al., 2011; Kariminia et al., 2007; Simpson et al., 2013). In a study of suicide and self-harm among a community corrections sample in the U.S., researchers found 41% reported contemplating suicide, 19% had attempted suicide, and 14% reported self-harm without lethal intent (Gunter et al., 2011). In Canada, suicide is the cause of up to 50% of deaths among incarcerated individuals, with suicide rates 2 to 11 times higher than among the general population (Simpson et al., 2013). According to recent data, the suicide rate among individuals in federal prison is 70 cases per 100 000 and in provincial prison is 43 cases per 100 000, compared to the general Canadian population rate of 10.2 cases per 100 000 (Kouyoumdjian et al., 2016). Unfortunately, suicide risk and rates of suicide appear to remain high for incarcerated individuals after release, with the suicide risk especially high for those admitted to psychiatric inpatient care (Kariminia et al., 2007). Research demonstrates suicidal ideation (i.e., thinking about suicide) in particular among incarcerated persons is associated with greater lifetime depression, traumatic life experiences prior to age 18, Caucasian race, and the existence of drug dependence (Gunter et al., 2011). Suicide attempts meanwhile are associated with more lifetime depression and traumatic experiences prior to age 18 (Gunter et al., 2011).

### **Mental Health and Wellness Programs**

Given the high prevalence of mental health concerns among incarcerated populations, it is perhaps surprising that the literature regarding health and wellness programs targeting mental health among incarcerated individuals remains limited (Battaglia et al., 2015; Cramer et al., 2017; Kouyoumdjian et al., 2015). For instance, in a systematic review of interventions to improve the health of individuals in prison, Kouyoumdjian et al. (2015) only identified two small wellness programs designed to improve the mental health of prisoners. One study examined the implementation of a group music therapy course which was found to improve anxiety and depression symptoms above the effects of standard care. The second study examined the impacts of a yoga course and showed greater improvements in mental health compared to a control group (Kouyoumdjian et al., 2015). Consistent with these findings, Sfindla et al. (2018) found yoga to decrease mental health symptoms in all areas, with improvements on OCD, paranoid ideation, and somatic symptom levels demonstrated to be greater than the effect of a free-choice exercise group.

Regarding exercise, a growing body of research in both the general population (Chekroud et al., 2018; Choi et al., 2019; Gordon et al., 2018; Schuch et al., 2016) and incarcerated populations (Battaglia et al., 2015; Clouse, Mannino, & Curd, 2012) have found physical activity to be a viable and effective way to improve mental health. Among members of the general U.S. population, researchers found that exercise was associated with a 1.49 day (43.2%) lower mental health burden per month (Chekroud et al., 2018). Popular sports, cycling, and aerobic/gym exercises, and vigorous exercise, compared to moderate or light exercise, was associated with the greatest improvements in mental health burden. In particular, an exercise



duration of 30 to 60 minutes and 2-6 hrs per week showed the lowest mental health burden. Interestingly, the strongest effects of exercise on improved mental health burden were found for those with a previous diagnosis of depression (Chekroud et al., 2018). In a recent literature review, Gordon et al. (2018) similarly found that a majority of studies indicate reductions in depression following resistance exercise training (RET) and aerobic exercise training (AET).

One study evaluating the effectiveness of the Wellness Works program, a prison-based wellness program involving increased opportunities for physical exercise and education workshops regarding physical exercise and nutrition, found participating individuals experienced reductions in depression symptoms, stress levels, and smoking behaviour (Clouse, Mannino, & Curd, 2012). Similarly, Battaglia et al. (2015) found that individuals who participated in either cardiovascular plus resistance training (CRT) or high-intensity strength training (HIST) during incarceration showed improved mental health symptoms compared to a control group. Specifically, incarcerated individuals who participated in CRT showed decreases in interpersonal sensitivity, a general symptom index, and anxiety and depression symptoms. Incarcerated individuals who participated in HIST showed decrease general anxiety, phobic anxiety, and depression symptoms (Battaglia et al., 2015).

### **Health among Incarcerated Indigenous Peoples in Canada**

As of 2018, despite representing only 4.3% of the general Canadian population, Indigenous peoples represented 28% of the incarcerated population in Canadian federal penitentiaries (Office of the Correctional Investigator, 2018). Given this overrepresentation of Indigenous peoples in the Canadian federal prison system,

researchers as well as government and community organization have expressed great concern regarding the health needs of Indigenous peoples in Canadian prisons. Despite this concern, research regarding the health of Indigenous peoples, like many other marginalized groups (e.g., BIPOC, LGBTQ+), in Canadian prisons remains sparse. Nonetheless, there is preliminary evidence for disproportionate health needs among Indigenous peoples incarcerated in Canada.

### **Physical Health of Incarcerated Indigenous Peoples**

According to recent research, Indigenous peoples in Canadian prisons have higher rates of a variety of physical health conditions. For instance, Indigenous peoples incarcerated in Canada experience higher rates of hepatitis C, diabetes, injection drug use, alcohol consumption, smoking, and obesity when compared to their non-Indigenous peers (Nolan & Stewart, 2017). Indigenous peoples in federal penitentiaries are also more likely to have central nervous system-related health problems, including head injuries, seizures, and spinal injuries (Stewart et al., 2018). Respiratory health conditions are similarly more common among Indigenous peoples incarcerated in Canada, including higher rates of asthma, bronchitis, and pulmonary disease than their non-Indigenous peers (Stewart et al., 2018). In a recent study, researchers found that incarcerated Indigenous peoples were more likely to gain weight during incarceration than individuals of other ethnicities (Johnson, Chaput, Diasparra et al., 2018). Arries and Maposa (2013) have also found a higher prevalence of cardiovascular disease risk factors among Indigenous peoples in prison, including hypertension, smoking, and diabetes.

## Mental Health of Incarcerated Indigenous Peoples

Regarding mental health, research has found Indigenous peoples in prison are more likely to have current, severe symptoms of a mental health disorder than their non-Indigenous peers (Brown et al., 2015). Indeed, a recent report by the Office of the Correctional Investigator (2018) identified that Indigenous peoples in Canadian prisons are disproportionately involved in self-injurious behaviour, accounting for approximately 48% of all self-injurious incidents in Canadian federal penitentiaries between 2017 and 2018. Similarly, Stewart et al. (2010) found Indigenous peoples in prison had higher mental health risk and greater need compared to their non-Indigenous peers. Moreover, incarcerated Indigenous peoples had similar levels of overall psychological distress compared to their non-Indigenous peers, but they had significantly higher levels of psychological distress compared to the general Canadian population (Stewart et al., 2010). Rogerson, Jacups, and Caltabiano (2016) also found 70% of Indigenous men in prison reported using cannabis within three months of incarceration, 64.2% of whom met criteria for cannabis dependence.

## Conclusion

Given the breadth of research reviewed here, it is clear that incarcerated persons in Canada have a disproportionately high prevalence of both physical and mental health conditions. It is also clear that, while limited, the current literature points to a number of effective ways that future health and wellness programs can improve the overall health of incarcerated persons in Canada, particularly physical exercise and education programs. With this in mind, the following recommendations are suggested for researchers and organizations interested in implementing future health and wellness programs in the Canadian prison

context, as well as the future research that is needed to evaluate the effectiveness of such programs.

- 1) *Take a holistic perspective*: The breadth of evidence discussed in this literature review demonstrates the complex and multifaceted nature of the needs of incarcerated persons in Canada. As such, any health and wellness program implemented in the Canadian prison context should take a holistic perspective by focusing on the health of prisoners as a whole and not simply one aspect of health, such as physical *or* mental health, alone.
- 2) *Health outcomes occur as cascades*: Related to the notion of taking a holistic perspective, health outcomes do not occur alone but are connected to one another. Therefore, any health and wellness program that targets one aspect of health can, and likely will, result in a cascade of outcomes with regards to other aspects of health that were not specifically targeted. For instance, programming designed to reduce obesity by increasing the physical activity of individuals in prison may also improve individuals' depression symptoms. Thus, it is important to assess a cascade of outcomes.
- 3) *Physical exercise and health education can be powerful*: As is evident from the reviewed literature regarding health and wellness programs, physical exercise and education-based programming can be effective ways to improve both physical and mental health. In particular, the participatory research study conducted by Elwood et al. (2013) is one example of the effectiveness of exercise and

- educational programming for multiple aspects of health among incarcerated individuals.
- 4) Examine health outcomes at multiple time points: The vast majority of high-quality studies discussed in this review, as well as in the meta-analyses and literature reviews mentioned in this review, used research designs that allowed the researchers to assess the outcomes of their programs overtime, with at least two time points of measurement in order to assess the progress participating incarcerated individuals made over the course of the program. Future wellness programs would similarly benefit from assessing health outcomes at multiple time points in order to determine the incremental value of longer wellness programs (e.g., 1-year), in contrast to briefer wellness programs (6-weeks).
  - 5) Comparing health outcomes to a control group: Assessing the difference between a pretest and post-test is informative regarding the progress incarcerated individuals have made but determining whether a wellness program was effective or not can be greatly clarified with the inclusion of a control or comparison group (i.e., a group of inmates that did not participate in the program but were assessed along with those who did participate). Despite the challenges associated with control groups in all applied research, and prison research in particular, control groups allow researchers to determine whether the progress participating individuals made was due to the wellness program itself or whether it was the same progress that would have occurred naturally regardless of the program.
  - 6) Using a reliable and valid assessment of mental health: To properly assess mental health outcomes following any wellness program, it is important to select a measurement tool that is both valid and reliable for use in a prison context, as well as practical given the constraints of the program and its evaluation. For this reason, the Brief Symptom Inventory (BSI) is recommended as a research tool for assessing the mental health symptoms of incarcerated persons, particularly in the context of Canadian prisons. The BSI is already one component of the larger mental health intake screening system called CoMHISS that is used by Correctional Service of Canada (CSC; Stewart et al., 2010). Thus, for program designers and researchers, the CSC is already familiar with the BSI as a tool for mental health screening. Beyond this, the BSI is also a standardized research tool used extensively in the research literature for examining the mental health of incarcerated persons (e.g., Martin et al., 2018; Maschi, Viola, & Morgen, 2014; Sfindla et al., 2018).
  - 7) Include considerations of different groups of incarcerated persons: Given the reviewed findings regarding different groups of incarcerated persons in Canada (i.e., men and women, older and younger, and Indigenous and non-Indigenous persons), it is important to ensure future wellness programs are specifically designed with these different groups of incarcerated persons in mind. For instance, given the relative lack of published research regarding effective wellness programs for incarcerated Indigenous peoples and older adults, future research on and implementation of wellness

programs designed for these groups should be a particular priority. Additionally, greater research attention is needed to better understand the health status of other marginalized groups in the Canadian prison system (e.g., BIPOC individuals, LGBTQ+ individuals), as well as the effectiveness of wellness programs for these groups in the Canadian prison context.

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