Shifting Gears

The need to address healthy eating, physical activity and mental health together

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The intent of this paper is to shed light on the importance of addressing healthy eating, physical activity and mental health in a comprehensive way. It will help to inform the work of the Waterloo Region Healthy Communities Partnership' and Region of Waterloo Public Health.

Health promotion strategies can include activities at the individual level to increase awareness and knowledge, and build skill; as well as at a broader societal level to create supportive environments and develop policies.

The local data on these health topic areas will be presented. Existing literature will be used to highlight the interconnections between healthy eating, physical activity and mental health. To provide context, examples of current health promotion approaches that complement and contradict each other will be provided.

Key Messages of this report:

- Current levels of physical activity and healthy eating are not adequate to support good health for the majority of the population
- Healthy eating, physical activity and mental health are inter-connected
- Strategies and activities to improve healthy eating, physical activity and mental health should complement each other and avoid contradicting each other
- To improve healthy eating, physical activity and mental health, strategies and activities should involve a comprehensive approach that includes individual and community level actions to support individuals in leading healthier lives

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i The Region of Waterloo has established and co-ordinated a Healthy Communities Partnership to take action regarding three community identified priorities: healthy eating, physical activity, and mental health promotion. The Waterloo Region Healthy Communities Partnership is part of a provincially mandated health promotion strategy that asks local community members to identify and advocate for local policy actions to improve health outcomes and reduce levels of chronic disease.
Self-reported health indicators, Adults 18+ years
Canadian Community Health Survey (CCHS), Waterloo Region, 2009–2010

The Local Picture

Vegetable and Fruit Consumption
40.9% of adults ate vegetables and fruit five or more times per day

Physical Activity
49.8% of adults reported being moderately physically active or active during leisure time

Perceived Mental Health
72.6% of adults have very good or excellent mental health
77% of the adult population were not at all stressed, not very stressed, or a bit stressed
64.5% of adults have a very strong or somewhat strong sense of belonging in the community

Chronic Health Conditions
17.4% of adults had been diagnosed with high blood pressure
8.2% had been diagnosed with diabetes
3.3% had been diagnosed with heart disease
1.6% had been diagnosed with cancer

Body Mass Index (BMI)
51.6% of adults were classified as overweight or obese

1 All measures were comparable to the provincial average.
Comparison of Local CCHS Data to NEWPATH Data

In 2009, the Neighbourhood Environment in Waterloo Region: Patterns of Transportation and Health (NEWPATH) study was conducted in Waterloo Region. The NEWPATH study evaluated how different urban built environments impact a variety of quality of life factors including diet and physical activity; however, the NEWPATH study did not include mental health indicators.

Healthy Eating

The Healthy Eating Index (HEI) is a more detailed measure of healthy eating than assessing frequency of vegetable and fruit intakes alone. The HEI uses a point system to compare dietary intake to Canadian nutrition recommendations. In 2004, the CCHS included a 24-hour recall component to assess dietary intakes, in addition to the core dietary assessment questions. This assessment demonstrated that only 0.5 per cent of the respondents consumed a diet classified as ‘good’, 82.9 per cent consumed a diet classified as ‘needs improvement’ and 16.6 per cent consumed a diet classified as ‘poor’. The average HEI score was 58.8 out of 100. The results of the NEWPATH study conducted in 2009 were similar, as 39.6 per cent of participants consumed a ‘poor’ quality diet and 60 per cent consumed a diet that ‘needs improvement’. Only 0.3 per cent of participants met the criteria for a ‘good’ diet. The average score of 53.2 indicates that the average diet of residents in Waterloo Region is much closer to the ‘poor’ diet category than the ‘good’ diet category. Therefore, 99 per cent of the residents in Waterloo Region consume a diet that increases the risk of developing chronic health conditions. This number is considerably more than the 59 per cent of the population identified in 2009 by the frequency of vegetable and fruit intake CCHS indicator.

Ninety-nine per cent of the residents in Waterloo Region consume a diet that increases the risk of developing chronic health conditions

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ii The 2004 CCHS collected 24 hour recalls for 35,107 people with a second 24-hour recall collected for 10,786 people (aged 2+).

iii The 2009 NEWPATH study collected two day food records from 2000 respondents (aged 11+).
Physical Activity

Accelerometers were used in the NEWPATH study to measure physical activity levels, iv which showed that 54.6 per cent of participants accumulated at least 30 minutes of moderate- to vigorous-intensity physical activity on at least one day. iv This includes all activity of at least a moderate intensity undertaken during commuting, at work and during leisure time. Comparing CCHS data to NEWPATH data shows that the measured NEWPATH physical activity indicator is actually higher than the CCHS self-reported leisure time physical activity indicator. This is an unexpected finding as the accelerometer data from the Canadian Health Measures study v has shown that the majority of Canadians (about 85 per cent) do not achieve the recommended 150 minutes of moderate-to-vigorous activity per week. v

The differences observed between data indicators for physical activity may be due to data collection methods. For more discussion on the details of data collection and limitations of the data used in this report, see Appendix A.

iv The 2009 NEWPATH study assessed the accelerometer data for 747 adults (aged 18+) who wore accelerometers during waking hours for one to two days for the purpose of assessing travel patterns.

v The Health Measures Survey collected accelerometer data from 2,832 respondents who wore the accelerometer during waking hours for at least four days (aged 20 to 79 years).
Relationship with chronic health conditions

The development of chronic health conditions is independently linked to eating habits, levels of physical activity and mental health status.6-10

Diets low in vegetables, fruit and whole grains, as well as diets high in added fat, sugar, sodium, red meat and processed red meat, are related to higher risks of developing nutrition-related health conditions such as obesity, stroke, high blood pressure, type 2 diabetes, heart disease and certain types of cancer.6,11,12

Engaging in 150 minutes of moderate-to-vigorous physical activity each week is associated with a reduced risk of developing chronic health conditions such as type 2 diabetes, cardiovascular disease, obesity and certain types of cancer.9 Risks are reduced further when people exceed the minimum recommendations of the Canadian Physical Activity Guidelines. Time spent in sedentary activities, such as watching television, has been linked to increased risk of type 2 diabetes, obesity, cardiovascular disease, high blood pressure and metabolic syndrome no matter how active a person is at other times.9

Individuals with mental health problems such as depression are more likely to develop chronic health conditions such as cardiovascular disease.10,13 The presence of one or more chronic health conditions appears to increase the risk of developing symptoms of poor mental health.10 When individuals with chronic disease also have symptoms of poor mental health they are less likely to adhere to recommended lifestyle changes. For example, depression may lower motivation, energy and confidence required to maintain difficult behavioural changes such as increased physical activity and healthy eating habits.14-16 As a result, the presence of poor mental health status can exacerbate chronic conditions (e.g., blood glucose management in diabetes).10,14

Relationship between physical activity, healthy eating and mental health

The closely linked relationship between physical activity levels, eating behaviours and mental health means they may influence one another and the health outcomes of individuals. A connection between healthy eating and mental health has been found in some studies, but not others.17 Having symptoms related to poor mental health such as depression, high levels of stress or poor levels of social support are related to consuming a poor quality diet.18-22 Eating a diet low in vegetables and fruit and high in processed foods has also been linked to poorer mental health outcomes,23 while eating a diet high in vegetables and fruit has been shown to improve mood24 and may be protective against mental health problems.23
The relationship between diet and mental health outcomes is likely bi-directional. For example, depression has been linked with poor self care. It is possible that depressive symptoms result in lower levels of interest, motivation, energy and confidence which are required to maintain self-care activities. Depressive symptoms are also related to poor food choices, emotional eating, using food to reduce emotional distress, inability to distinguish hunger from other negative states, skipping meals, a preference for energy-dense food and a tendency to consume easy to prepare food. Poor mental health outcomes may also occur as a result of poor eating habits. Plausible mechanisms include nutrient deficiencies, such as macronutrients, vitamins, minerals, or omega-3 fatty acids, neurochemical changes, reduced cognitive function or inflammatory process.

The relationship between physical activity and healthy eating is less clear. Physical activity and eating behaviours are linked, where physically active individuals tend to consume healthier diets and vice versa. Some researchers believe that performing physical activity enhances the processes in the brain that help people make healthier food choices. However, it has also been found that some people increase their food intake when they are physically active, which may lead to a poorer diet quality.

The relationship between physical activity and depression may be bi-directional. For example, sedentary behaviour such as watching television has been associated with an increased risk of developing depression. In this instance, sedentary behaviour may displace physical activity and may lead to reduced social interaction, leading to an increased risk of depression. Physical activity may improve or prevent symptoms associated with poor mental health such as distress, depression and anxiety. Several plausible mechanisms exist to explain this effect. Physical activity may act as a distraction and provide opportunity for social interaction. Physical activity may also increase self-efficacy, self-esteem, sense of mastery and self-worth or cause biochemical or physiological changes that support mental health.

Access to green spaces has been found to have beneficial effects on leisure time physical activity, social connection and mental health. A strong sense of community belonging has been associated with better self-reported physical activity and mental health. Conversely, the development of mental health problems, high levels of stress and social isolation may result in people becoming less active.
Complementary Approaches

In light of the interconnectedness of healthy eating, physical activity and mental health and their impact on the development of chronic health conditions, it makes sense to use a comprehensive health promotion approach that addresses all three areas. Region of Waterloo Public Health has supported two local projects that have demonstrated this integrated approach to health promotion:

- The Community Garden Storytelling Project highlights the use of a community garden in a “placemaking” initiative. Participants benefit from increased physical activity, increased access to vegetables and fruit, reduced stress and improved mental well-being and sense of belonging.\(^{48}\)

- The Neighbourhood Markets project was also a “placemaking” initiative within selected neighbourhoods. The markets increased access to local vegetables and fruit in neighbourhoods with poor access to fresh produce. The markets created a destination that was easily accessed by active transportation. As a result of the markets, participants had increased feelings of social connectedness and belonging.\(^{49}\)

Moving forward, the Waterloo Region Healthy Communities Partnership is committed to using a comprehensive approach that addresses all three areas.

Contradictory Approaches

Isolated health promotion efforts may unintentionally undermine health promotion in other areas. Below are four scenarios that illustrate how this can happen.

- Health promotion initiatives often focus on changing individual eating and physical activity behaviours in an effort to prevent the development of chronic health conditions.\(^{50,51}\) This approach ignores the powerful environmental influences on physical activity and eating behaviours. As a result, individuals who have not maintained healthy behaviours are often blamed for their condition (e.g., obesity). This has led to weight stigma and discrimination resulting in poor mental health and a lower quality of life for affected individuals.\(^{50-52}\) The effects of discrimination in general can compromise mental health and may prevent individuals from participating in health promoting behaviours such as healthy eating and physical activity.\(^{51-54}\)
• The focus on weight as the major contributor to poor physical health may lead individuals who have maintained a normal weight to falsely believe that they do not need to address their eating or physical activity habits.\textsuperscript{52} This is concerning as the NEWPATH study shows that almost all individuals in Waterloo Region consume diets that require substantial improvements.\textsuperscript{3} Similarly, accelerometer data from the Canadian Health Measure Survey shows that 85 per cent of Canadian adults do not spend enough time being physically active enough to support good health\textsuperscript{5}

• Physical activity is often considered to be an appropriate way to compensate for consuming less healthy food and beverages (e.g., eating a dessert as a reward after a workout).\textsuperscript{55} The food and beverage industry often proposes that the responsible solution for consuming less healthy food and beverages is increased physical activity to prevent weight gain, rather than limiting consumption of foods described as “Foods to Limit” by \textit{Canada’s Food Guide} (e.g., salty snacks, chocolate, candy, baked goods, fried food and sugar sweetened beverages).\textsuperscript{56,57} However, the majority of the population is not active enough to allow for regular consumption of “Foods to Limit”.\textsuperscript{2,5} Using physical activity to counteract suboptimal eating habits is likely counterproductive, as people often overestimate the number of calories that they are burning through physical activity and underestimate the number of calories they consume.\textsuperscript{55,57} In addition, physical activity cannot eliminate the health risks caused by not eating enough vegetables, fruit and whole grains and eating too much fat, trans fat, sugar and salt

• Infrastructure and programming to promote physical activity is often financed using the sale of less healthy foods (e.g., vending machines and snack bars in recreation facilities, fundraisers for sports teams, corporate sponsorship for programs, etc.), which undermines efforts to promote healthy eating\textsuperscript{56,58,59}
A Comprehensive Health Promotion Approach

Consideration should be given to ensure that health promotion strategies and activities aimed at improving one aspect of health (i.e., healthy eating, physical activity, and mental health) do not inadvertently contradict other health promotion efforts. It is important to address all areas at once to maximize health benefits.

This paper has outlined the need for a comprehensive approach to improve healthy eating, physical activity, and mental health and eliminate contradicting messages and activities. It is proposed that moving forward, a unified and comprehensive strategy be used for all health promotion activities related to healthy eating, physical activity, and mental health.
References


57. Shelley JJ. Addressing the policy cacophony does not require more evidence: An argument for reframing obesity as caloric overconsumption. BMC public health 2012;12(1).


Appendix A:  
Limitations of Data Indicators

Accuracy of Data Reporting

Self-reported measures are commonly used in research; however, there are known limitations to self-reported data. The accuracy of data can be diminished when self-reported measures are subject to social desirability, memory errors and reporting bias. This can create a false relationship between variables or obscure relationships between variables. As people become aware of the benefits of healthy behaviours, they tend to report performing them more often. Similarly, people tend to under-report conditions that are associated with stigma, such as poor mental health.

Responses influenced by social desirability can cause data to appear more optimistic than measured variables. For example, in Canada, self reported BMI is eight per cent lower than measured BMI and self-reported physical activity rates are 35 per cent higher than measured rates. In 2004, dietary analysis for the CCHS, showed that only 53 per cent of respondents reported plausible dietary intakes. This means that 47 per cent of the respondents reported intakes that were too low or too high to support their predicted energy needs. In one Canadian study, three-quarters of individuals who had received treatment for mental health issues reported not receiving any treatment.

Validity of Data Indicators

**Body Mass Index (BMI)**

BMI classifies body weight into health risk categories. BMI is recommended for use among Canadian adults aged 18 years and older except for pregnant and lactating women. BMI may not be an accurate measurement for young adults who have not reached full growth, adults who are naturally very lean, adults with a very muscular build and some ethnic populations.

BMI is a proxy indicator of body fatness and is used for monitoring health risk due to excess weight at a population level. Although BMI has been correlated with the development of other chronic health conditions, it has a low sensitivity for detecting body fatness. The low sensitivity of the BMI measure may lead to misclassification errors (e.g., a person who has a ‘normal’ BMI but who has larger amounts of body fat, which may increase health risks). Therefore, BMI is an imperfect measure of body fatness and subsequent risk of developing chronic disease.

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vi Plausible dietary intakes were defined as reported energy intakes falling between 70 to 142% of predicted energy expenditure.
**Vegetable and Fruit Intake as a Proxy Indicator**

Frequency of vegetable and fruit intake is a proxy measure for diet quality. While the frequency of vegetable and fruit intake is linked to overall diet quality,\(^{10}\) it has limitations by not accounting for serving sizes, total energy intakes or intakes of foods known to have a negative influence on health such as foods designated as “Foods to Limit”.\(^{11,12}\)

**Healthy Eating Index (HEI)**

The HEI uses a points system to assess adequacy of diet based on dietary recommendations such as consumption of total fruit, whole fruit, total vegetables, dark green and orange vegetables and legumes, total grains, whole grains, milk, meat and beans, and unsaturated oils. The HEI also awards points for moderation in dietary components that promote poor health such as saturated fats, sodium, solid fats, alcohol and sugar.\(^{10}\) The HEI classifies diets as ‘poor’ (between 0 to 49 points) ‘needs improvement’ (50-80) and ‘good’ (81-100).\(^{10}\)

The data collection for dietary intake in the CCHS and NEWPATH studies used self-reported measures, including interviews for 24-hour recalls (CCHS) and self-administered food records (NEWPATH). Both methods are subject to socially desirable responses including changing intake on days where intake is recorded and inaccurate recall of food that is consumed, leading to under reporting of foods perceived as less healthful and over reporting consumption of healthier foods.\(^2\)

**Leisure Time Physical Activity (LTPA) as a Proxy Indicator**

LTPA is often used as a proxy indicator for overall physical activity; however, there are limitations to this indicator. A recently published study on Canadian adults found that LTPA represents only a fraction of total daily energy expenditure because it does not account for physical activity carried out during household work and occupational work.\(^{13}\) As well, LTPA doesn’t account for the roles that sedentary behaviour and light intensity activity play in obesity and overall health.\(^3\) Sedentary behaviour has unique health effects independent of those associated with a lack of LTPA.\(^3\) Therefore, the study of leisure time physical activity in isolation does not provide a full assessment of daily physical activity levels.

**Accelerometer Data**

Accelerometer data is collected by having participants wear an accelerometer device which records the amount and intensity of physical activity performed each day. Accelerometers do have some limitations as they only record step-based activities leading to a potential underestimation of overall physical activity (e.g., activities such as swimming and weight lifting are not recorded).\(^3\)
Cut points are used to classify the recorded movements into intensity levels (sedentary, light, moderate and vigorous). Depending on the numerical cut points that are used to define moderate and vigorous physical activity, it may be difficult to compare data collected using accelerometers in different studies. There may also be variation between studies on the mathematical calculations that are used to translate accelerometer data into levels of physical activity.

The duration of data collection may depend on the purpose of collecting physical activity data. Some researchers suggest that three to five days of monitoring are required to reliably estimate habitual physical activity. The Canadian Health Measures Survey data was based on participants who had at least four complete days of data and involved more rigorous statistical calculations. The NEWPATH study, which assessed travel patterns rather than overall physical activity levels, used one to two days of accelerometer data. These methodological differences may account for the inconsistency in the accelerometer results between the Canadian Health Measures Survey and the NEWPATH study.

**Perceived Mental Health as a Proxy Indicator**

The perceived mental health measure in CCHS is closely associated with the presence of mental illness. However, in a validation study of the perceived mental health question, several individuals with diagnosis of mental illness did not report poor mental health and several individuals with no diagnosis of mental illness reported poor mental health. The authors concluded that the perceived mental health question may underestimate the prevalence of poor mental health. A limitation of this model is that it assumes that someone with mental illness cannot experience positive mental health and vice versa.

Researchers believe that mental health and mental disorders are not the opposite ends of the same continuum but rather two separate and yet correlated items.

The World Health Organization defines mental health as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.” Factors related to mental health in this sense include dimensions such as: life enjoyment/satisfaction, coping ability, emotional well-being, spiritual values, social connectedness, respect for culture, equity, social justice and personal dignity, optimism and hope, self-esteem, self mastery, a sense of control and having a purpose in life. In order to get a sense of overall mental health or well-being, indicators other than perceived mental health are valuable. The CCHS indicators include two measures that have been identified as influential in promoting wellness: self-reported stress levels and sense of belonging.

Mental health is tough to measure and the perceived mental health indicator is an incomplete measure of overall mental health and well-being. Therefore, self-reported stress levels and sense of belonging are included to gain a more robust view of mental health in the community.
References for Appendix A:

5. Garriguet D. Impact of identifying plausible respondents on the under-reporting of energy intake in the Canadian Community Health Survey. 2008.