

Université de Montréal

**Sociodemographic, Lifestyle and Psychological Factors Associated With
Positive Mental Health In Young Adults**

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de Montréal (ESPUM)

Ce mémoire intitulé

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Positive Mental Health in Young Adults**

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I Résumé

Introduction : La santé mentale « florissante » est définie par un niveau de bien-être émotionnel, social et psychologique élevé. Les déterminants des troubles mentaux ont été largement étudiés chez les jeunes adultes mais peu d'études examinent les facteurs associés à la santé mentale positive.

Objectifs : Identifier les facteurs associés à une santé mentale florissante chez les jeunes adultes âgés de 28 à 34 ans.

Méthodes : Cette étude transversale utilise les données de 792 participants de l'étude NDIT (âge moyen (ET) = 30,6 (1,0) ans) ayant fourni des informations sur leur santé mentale positive, mesurée avec le Mental Health Continuum (MHC-SF). Les corrélats potentiels sociodémographiques, liés au mode de vie et psychologiques ont été analysés via des modèles de régression logistique. Trois modèles ont été effectués pour chaque corrélat : un modèle non ajusté, un modèle avec ajustement minimal, et un modèle ajusté.

Résultats : Les variables associées à une probabilité plus élevée de rapporter une santé mentale florissante incluent : études universitaires complétées (OR [IC 95%] =1,44 [1,05-1,99]), être en couple (1,64 [1,22-2,21]), avoir un emploi (1,97 [1,27-3,11]), qualité de sommeil élevée (3,45 [2,53-4,73]), respecter les lignes directrices sur le temps d'écran (2,12 [1,59-2,85]) et avoir une capacité d'adaptation élevée (3,11 [2,58-3,80]). Les variables associées à une probabilité plus faible incluent: vivre seul (0,58 [0,38-0,86]), faible revenu annuel du ménage (0,37 [0,20-0,64]), symptômes dépressifs (0,05 [0,01-0,15]) et anxieux (0,17 [0,09-0,29]).

Conclusion : Identifier des sous-groupes moins susceptibles d'avoir une santé mentale florissante peut contribuer à orienter des programmes de promotion de la santé mentale. D'autres études longitudinales sont nécessaires pour explorer la causalité des associations.

Mots-clés : Santé mentale positive, florissante, caractéristiques sociodémographiques, habitudes de vie, caractéristiques psychologiques, jeunes adultes, étude transversale.

II Abstract

Background: “Flourishing” refers to optimal positive mental health wherein high levels of emotional, psychological, and social well-being coexist. Although determinants of mental illness have been studied extensively in young adults, little is known about factors associated with flourishing mental health.

Objective: To identify sociodemographic, lifestyle, and psychological characteristics, associated with flourishing mental health in a population-based sample of adults ages 28-34 years.

Methods: Data for this cross-sectional study were drawn from cycle 23 of the ongoing NDIIT study, which included 792 participants (mean(SD) age=30.6(1.0) years), who completed the Mental Health Continuum (MHC-SF). Potential correlates investigated included sociodemographic, lifestyle, and psychological factors. Three logistic regression models were considered for each potential correlate: i) an unadjusted model, ii) a minimally adjusted model, and iii) a more fully adjusted model.

Results: Variables associated with higher odds of flourishing included attended university (OR[95%CI]:1.44[1.05-1.99]), being in a relationship (OR[95%CI]:1.64[1.22-2.21]), being employed (OR[95%CI]: 1.97[1.27-3.11]), relatively high sleep quality (OR[95%CI]: 3.45[2.53-4.73]), meeting leisure screen time guidelines (OR[95%CI]: 2.12[1.59-2.85]), and higher levels of coping ability (OR[95%CI]: 3.11[2.58-3.80]). Inverse associations included living alone (OR [95%CI]:0.58[0.38-0.86]), relatively low annual household income (OR[95%CI]: 0.37[0.20-0.64]), depressive symptoms (OR[95%CI]: 0.05[0.01-0.15]), and anxiety symptoms (OR[95%CI]: 0.17[0.09-0.29]).

Conclusion: Identification of subgroups of young adults without flourishing mental health may inform the development and targeting of mental health promotion programs. Longitudinal data are needed to ascertain causality and identify mechanisms underpinning these associations.

Keywords: Positive Mental Health, Flourishing, Young Adults, Sociodemographic, Lifestyle, Psychological, Correlates, Cross-sectional

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V List of Acronyms

GAD-7	Generalized Anxiety Disorder 7-items
IPAQ-SF	International Physical Activity Questionnaire Short Form
MDI	Major Depression Inventory
NDIT	Nicotine Dependence in Teens
MHC-SF	Mental Health Continuum – Short Form
MPA	Moderate Intensity Physical Activity
MVPA	Moderate to Vigorous Intensity Physical Activity
VPA	Vigorous Intensity Physical Activity

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Chapter 1 Introduction

Mental disorders and mental health are major public health challenges today (WHO, 2022), especially in young adulthood, a life stage which is now considered to extend into the 30s (Arnett, 2000; Lane, 2015). This stage, marked by critical life transitions and continued brain and emotional development, represents a time when mental health issues such as depression and anxiety, often emerge, contributing to long-term impacts on well-being (Morales-Muñoz et al., 2023). Mental disorders are linked to multiple adversities among young adults such as lower academic achievement, poor functioning, difficulties in social relationships, chronic disease, cognitive impairment, morbidity, mortality, substance use, and violence (Dreger et al., 2014; Gilmour, 2014; Semkowska et al., 2019; Sylvia et al., 2017; Tunvirachaisakul et al., 2018; Van Dorn et al., 2012). Moreover, rates of mental distress have increased steadily among young adults (ages 18-34 years) in recent decades (America's Health Rankings, 2021; Moreno-Agostino et al., 2021; Thapar et al., 2022). Given the heavy burden of these increases on the individual and populational levels, there have been widespread calls for public health programming to prevent mental disorders and promote positive mental health (Iasiello et al., 2019). In addition, there is growing interest in the concept of positive mental health and increasing recognition that public health programming must consider both the notions of positive mental health in addition to mental disorders to address the growing burden.

Seminal work by (Keyes, 2002) generated recognition of the distinction between mental health and mental disorders in what is referred to as the “Two Continua Model”. Specifically, this model suggest that mental health and mental disorder or illness are not opposite ends of the same continua, but rather two separate continua that coexist (Keyes, 2005). To develop comprehensive understanding of mental health status, both mental disorders and levels of positive mental health should be considered (Keyes, 2005; Mjøsund, 2021). Mental health is understood as not only the absence of mental illness but also the presence of positive feelings and functioning (Keyes, 2005; Mjøsund, 2021). According to Keyes' model (Keyes, 2005), positive mental health includes three components of well-being: emotional, psychological and social well-being. Flourishing mental health is the most favorable positioning on the mental health spectrum, wherein high levels of emotional, psychological, and social well-being coexist. Flourishing is possible even in the presence of a mental disorder.

According to the Canadian Community Health Survey – Mental Health (CCHS-MH 2012), 71.1% of Canadians age 25 to 44 report flourishing mental health, a lower prevalence than among older adults (i.e., 74.4%, 79.6% and 78.3% in persons age 45-64, 65-74, and 75 years or older, respectively) (Gilmour, 2014). Individuals with flourishing mental health report fewer missed work days (Keyes & Grzywacz, 2005), better physical health, and lower health care utilization compared to those with languishing or moderate mental health. In addition, positive mental health is protective against mental illness, suicidal behavior (Keyes et al., 2012) and mortality (Gilmour, 2014).

Although positive mental health is increasingly recognized as an important target for public health programs and policies, the association between flourishing mental health and the many known risk and protective factors for mental disorders is largely understudied (Monteiro et al., 2021). Factors generally thought to relate to positive mental health in the general population include sociodemographic factors (i.e., education, marital status, income), physical health, social support and positive life events (Dreger et al., 2014; Gilmour, 2014; Keyes, 2005; Schotanus-Dijkstra et al., 2016). However few studies identify factors associated with positive mental health in young adults specifically (Howard et al., 2023; Nogueira et al., 2022; Nomaguchi & Milkie, 2003), possibly because many mental health symptoms often manifest for the first time in late adolescence or the second decade of life. Increased understanding of positive mental health correlates in this subgroup could provide evidence needed to develop mental health promotion programs targeting those at risk of languishing mental health during the challenging transitional years between adolescence and adulthood.

The aim of this Master's thesis is to identify factors associated with positive mental health in young adults. We focus on factors that are amenable to public health intervention to improve mental health among young adults. Chapter 2 of this thesis reviews the literature on what is known about the associations between sociodemographic, lifestyle and psychological variables and positive mental health or similar concepts (i.e., psychological flourishing, life satisfaction, happiness, finding meaning in life (Howell et al., 2016)). Chapter 3 details the specific objective of the thesis. Chapter 4 presents the methods, describes the Nicotine Dependence in Teens (NDIT) study (from which the data for this project were drawn), the study design used to address our objectives, the

study variables, and the methods of data analysis. In Chapter 5, a manuscript format is used to present the results of the study. Discussion of the results and their interpretation are detailed in Chapter 6, followed by a Conclusion in Chapter 7.

Chapter 2 Literature Review

The transition to adulthood which, according to several authors (Arnett, 2000; Medley, 1980; Weiland, 1993) extends into the late 30s, is marked by numerous stressful role and status transitions that may contribute to lower levels of mental health, more symptoms of mental disorders and a higher risk of mental illness among young adults (Lane, 2015). Risk factors for common mental disorders in young adults (e.g., anxiety and depression, which are the most prevalent mental disorders in Canada (Yeretzian et al., 2022)) have been studied extensively and include, among others, being female, having a history of depression, low self-esteem, lack of social support, poverty, unemployment, housing instability, chronic medical conditions, discrimination, substance use, and and addiction (Asselmann & Beesdo-Baum, 2015; Liu et al., 2020; Schaakxs et al., 2017; Whiting et al., 2021). However, considerably less is known about risk or protective factors of positive mental health. The reasons for this important knowledge gap are unknown, but may relate to a predominantly disease-focused paradigm in the medical world (Arango et al., 2018). Further, in addition to being a relatively new research domain, positive mental health is culturally sensitive (e.g., using local cultural expressions of good mental health to avoid over universalizing) (Snodgrass et al., 2017), leading to sporadic research attempts (Fusar-Poli et al., 2020). The following section summarizes current knowledge on positive mental health, with a specific focus on young adults. More specifically, it covers Keyes' (Keyes, 2002) definition of positive mental health and its epidemiology, the importance of positive and descriptive epidemiology, the potential correlates found in literature and the gaps in knowledge.

2.1 Positive Mental Health

The concept of mental health has evolved in recent years. Mental health is no longer considered as the absence of mental illness, but also includes the notion of positive mental health or well-being. The World Health Organization (WHO) defines mental health as “a state of mental well-being that enables people to cope with the stresses of life, to realize their abilities, to learn well and work well, and to contribute to their communities” (WHO, 2022). This definition builds on two longstanding traditions in studies on well-being (Lamers et al., 2011): the hedonic tradition (i.e., feelings of happiness) and the eudemonic tradition (i.e., optimal functioning in individual (growth) and social life)(Ryan & Deci, 2001).

Research on the hedonic approach demonstrates that happiness is associated with longer life, better physical health, more fulfilling jobs, and establishing good-quality personal relationships (Kashdan et al., 2008). From the eudaimonic perspective (Ryff, 2023), well-being is defined as having positive relationships as well as a sense of meaning and purpose in life. Both the hedonic and eudaimonic perspectives were unified by Keyes (Keyes, 2002) in the concept of positive mental health.

Research on positive mental health and its correlates has focused on hedonic or eudaimonic well-being, often operationalized as subjective well-being. In this overview of the literature, the term “positive mental health” is considered interchangeable with mental well-being, which is often the term used for good mental health in academic literatures and policy-making processes (Stewart-Brown et al., 2015; WHO, 2013).

2.2 Keyes’ Mental Health Model

According to Keyes (Keyes, 2002, 2005), mental illness and mental health are distinct, but related constructs that both contribute to the mental health state of an individual. Keyes proposed a two-continua model where one continuum indicates the level of mental health, while the other refers to the presence or absence of mental illness symptoms. Thus, individuals can simultaneously experience both mental health and mental illness to varying degrees.

Keyes’ model (Figure 1) distinguished three mental health levels: flourishing, moderate and languishing mental health, ranging from high to low hedonic (i.e. emotional) and eudemonic (i.e. psychological and social) well-being. Flourishing represents high levels of mental health, whereas languishing indicates low mental health levels. Individuals whose mental health is between flourishing and languishing are considered to have moderate mental health. A person without a diagnosed mental illness or symptoms of mental disorders can have low levels of positive mental health with challenges related to well-being and functioning. In the context of disability, chronic physical illness, psychosocial functioning and healthcare utilisation, any state less than flourishing is associated with increased impairment and a burden to the self and society (Keyes, 2007). Adults with languishing mental health without a mental illness diagnosis or symptoms are more likely

than adults with moderate mental health to experience reductions in work productivity and more limitations of activities of daily life (Keyes, 2002).

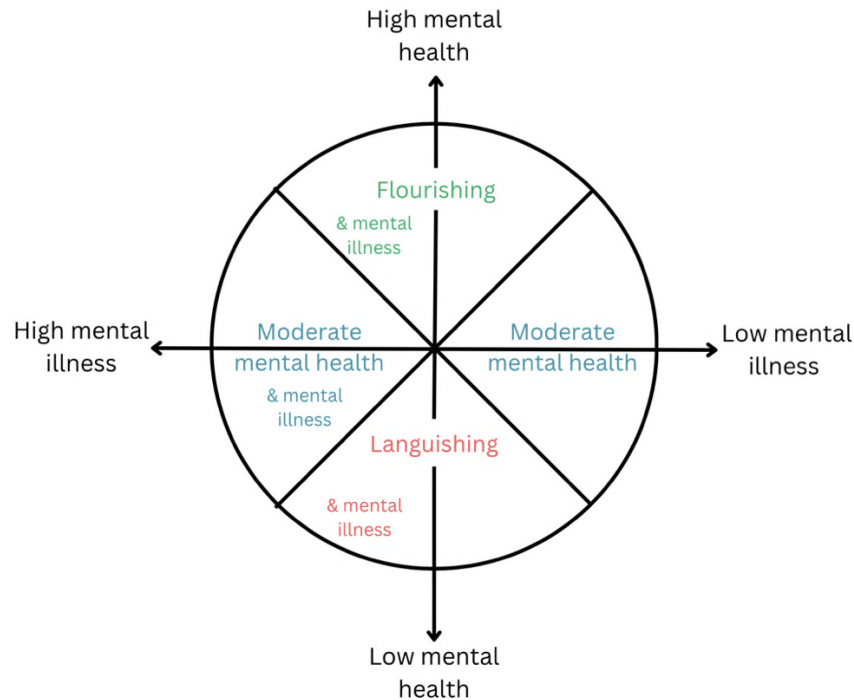


Figure 1. Keyes' two continua model of mental health and mental illness (Adapted from Keyes, 2007)

This conceptualization is the foundation of the Mental Health Continuum (MHC) scale and its short form (MHC-SF), which measures Positive Mental Health incorporating emotional, social and psychological well-being (Keyes, 2002).

2.3 Epidemiology of Positive Mental Health

Studies on positive mental health use different conceptual frameworks, measurement tools and target diverse study populations and age groups, which renders comparison across studies challenging. Table 1 presents the prevalence of flourishing mental health assessed using the MHC-SF across 12 studies involving various age groups and countries, with sample sizes ranging from 280 to over 25,000 participants. Prevalence rates of flourishing mental health vary considerably, from 11.7% in South Korea to 76.9% in Canada, possibly reflecting regional and cultural differences.

Table 1. Prevalence of flourishing positive mental health assessed using the MHC-SF in previous studies

Author(s), year	Target group (Age range, mean or median)	Sample size n	Flourishing prevalence %	Country
Keyes, 2005	Adults (25-74)	3,032	18.0	United States
Keyes et al., 2008	Adults (30 - \geq 80)	1,050	20.0	United States
Salama-Younes, 2011	Adolescents (12-18)	339	23.5	Egypt
Dyrbye et al., 2012	College students (N/A)	4,400	53.1	United States
Karas et al., 2014	Age > 16 (16-81)	2,115	26.0	Poland
Lim, 2014	10 th grade (mean 16.1)	547	11.7	South Korea
Petrillo et al., 2014	Adults (18-89)	1,438	30.9	Italy
Yin et al., 2013	Adults (20 - \geq 60)	2,021	43.4	China
Gilmour, 2014	Adolescents and adults (15 - \geq 75)	25,113	76.9	Canada
Singh et al., 2015	Adolescents (13-18)	539	46.4	India
Guo et al., 2018	Adolescents (grade 8 and 10)	5,399	57.4	China
van Niekerk RL, van Gent MM, 2021	University staff (mean 48.8)	280	60.0	South Africa
Concerto et al., 2022	Medical students (median [IQR] 23 [21-25])	399	11.8	Italy
Santini et al., 2022	Adolescents and adults (16 - \geq 55)	3508	64.5	Denmark

MHC-SF: Mental Health Continuum – Short Form

IQR: Interquartile Range

The pattern of positive mental health across the lifespan may depend on the country studied. Studies in western countries report a positive association between positive mental health and increasing age (Gilmour, 2014; Keyes, 2002; Van Lente et al., 2012; Westerhof & Keyes, 2010), or an inverted-U shaped association illustrating an increase in early adulthood and then a decline in the oldest adult age groups (Webster et al., 2014). Some studies, primarily in Europe, report that older age is associated with poorer mental well-being (Dreger et al., 2014; Winzer et al., 2014). In Canada, in 2012, the prevalence of flourishing mental health was 76.9% in the general population age 15 years or over (Gilmour, 2014), which is higher than that observed in the US, the Netherlands, South Africa, France, and Korea (11.7% to 69.1% range). However, different methods, age ranges, and populations studied likely contributed to the variation in prevalence. Young adults have the lowest prevalence of flourishing mental health after adolescents (Gilmour,

2014), and women report higher levels of flourishing than men during the early years of emerging adulthood (Ando, 2014, Schotanus–Dijkstra et al., 2016; Tong & Wang, 2017).

2.3.1 Correlates of Positive Mental Health

A *Positive Mental Health Identification Surveillance Framework* has been established by the Public Health Agency of Canada (Orpana et al., 2016). The framework proposed a total of 25 determinant indicators at the individual (e.g., coping, physical activity, substance abuse), family (e.g., relationships, income, household composition), community (e.g., school, workplace) and societal level (e.g., inequality, discrimination and stigma) that should be considered for surveillance of positive mental health (Orpana et al., 2016). The literature review focuses on factors at the individual and family levels since approaches to implement interventions that promote positive mental health at these levels can be relatively quick, because theoretically at least, they do not require structural change.

2.3.2 Public health programs and policy

Most mental health programs and initiatives, focus on symptom management, illness treatment, or prevention (e.g., depressive symptom management, addiction treatment, suicide prevention) rather than promoting positive mental health despite this being a key priority worldwide including in Canada (Capaldi et al., 2021). While programs for young adults do exist, they are less common and often part of broader, more general initiatives aimed at improving overall wellbeing (Capaldi et al., 2021; Teixeira et al., 2019).

At the individual and family levels, the focus of mental health promotion strategies is on increasing a sense of empowerment (CMHA, 2009). These strategies target a range of settings such as the workplace, home or school (CMHA, 2009), and the goal is to strengthen factors protective of positive mental health, reduce risk factors for poor mental health, and/or address the social determinants of mental health (CMHA, 2009). Initiatives that aim to improve coping skills and quality of life, enhance self-esteem, and strengthen social support (Fanslow, 2009) have increasingly been incorporated into positive mental health promotion programs. However, as depicted below (Figure 2), most mental health promotion initiatives focus on increasing awareness and consciousness; and few include the settings-based programs required to convert awareness

into behaviour and systemic changes (CMHA, 2019). For example, in Canada, the *Better Beginnings, Better Futures* project examined generativity¹ to promote positive mental health in young adults and reported that youth in *Better Beginnings* communities experienced more positive mental health than youth in comparison communities (Love et al., 2013). This project incorporated programs designed not only for children also but for the community as a whole, using home visits, parent support groups, parenting workshops and one-on-one support (Love et al., 2013). Other projects have been evaluated in the UK, Australia, Ireland and the Netherlands (Teixeira et al., 2019). However, no articles were to be found that describe the effectiveness of policies for positive mental health in adults. Moreover, evaluation of mental health promotion initiatives suffers from methodological challenges and a lack of longitudinal and diverse data (CMHA, 2019). Better understanding of the factors associated with positive mental health among young adults is needed to develop targeted mental health promotion strategies towards more promising outcomes.

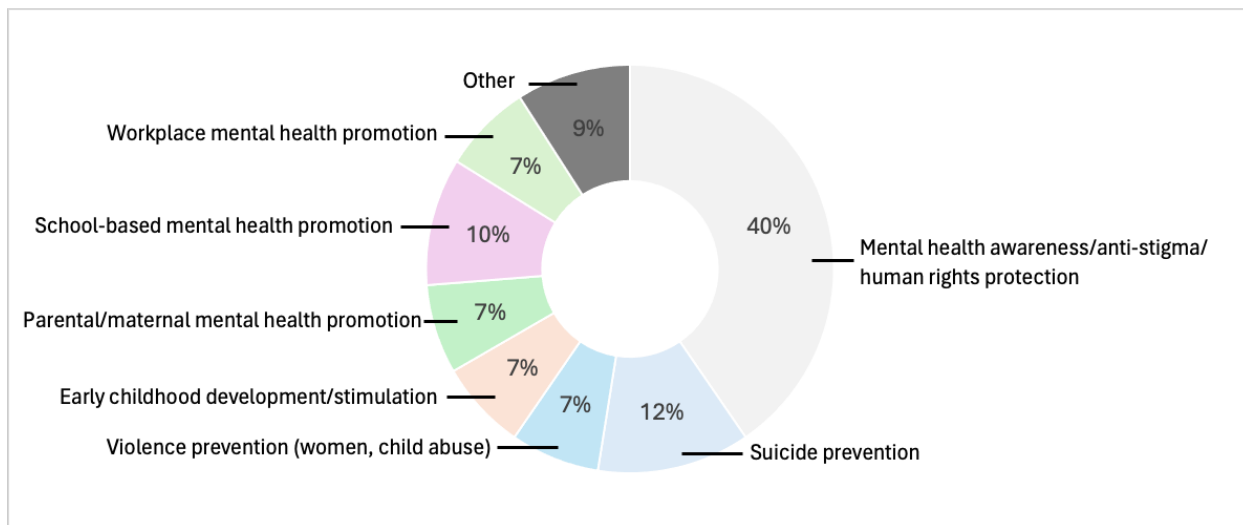


Figure 2. Main types of mental health promotion and prevention programs (Adapted from WHO Mental Health Atlas, 2017)

2.4 Positive Epidemiology

In contrast to a more traditional orientation of epidemiology which focuses on the risk of disease, VanderWeele et al. (2020) proposed the notion of positive epidemiology by suggesting that epidemiologists investigate positive health outcomes, including health in its fullest sense. The

¹ A positive mental health outcome that refers to an individual's commitment to care for future generations

World Health Organization (WHO) defines *health* as a “state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity”. Importantly, as previously stated, positive mental health reflects more than the absence of psychological distress and mental illness. Should the WHO integrative definition of health be taken seriously, flourishing mental health must be embraced as a fundamental public health goal. Our study contributes to this integrative definition and to positive epidemiology by identifying correlates of flourishing mental health.

2.5 Descriptive Epidemiology

In recent years, causal epidemiology has garnered considerable interest possibly at the expense of descriptive epidemiology despite its value in generating hypotheses especially in public health contexts (Fox et al., 2022). Descriptive epidemiology is “more concerned with describing associations than with understanding causal effects” (Porta, 2014). However, it is critical to describing the health state and needs of populations, identifying new areas to explore, supporting existing hypotheses, and providing information on the feasibility of future studies, particularly in emerging fields like positive mental health. The discovery of patterns in person, place, and time has driven notable public health achievements including the identification of risk factors (Fox et al., 2022).

Few studies provide descriptive evidence on the correlates of positive mental health, information which is crucial to identify sub-groups more or less likely to present flourishing mental health in the community, and providing a basis for mental health promotion interventions. The descriptive nature of the current study will help identify new areas and new associations to explore on factors amenable to public health intervention aimed at improving the positive mental health of young adults.

2.6 Summary of Literature Review Adults

Emerging adults feel in-between (i.e., no longer adolescents but not yet fully adult), they tend to focus on themselves (i.e., with fewer obligations than adults), they continue to explore their own identity (i.e., in love, at work, in holding world views), and they experience both instability and possibility (i.e., in changes in relationships, education, and residential status) (Arnett, 2000;

Schulenberg et al., 2004). The transition from adolescence to adulthood is marked by numerous changes and important decisions (Schulenberg et al., 2004) that impact the direction that one's life will take and affect one's sociodemographic, lifestyle, and psychological characteristics.

The age range of 28-34 years selected for this study is driven in part by the data available. In particular, the first measure of positive mental health in the NDIT dataset was obtained in cycle 23. While this specific age range may not be commonly studied, it is a reasonable selection given that emerging adulthood generally spans from the late teens to the late 20s, with some studies suggesting the transition to full adulthood may continue into the 30s (Arnett, 2000; Nelson, 2021). In fact, several studies examining young adulthood often use age groups that overlap or are somewhat broader (e.g., 18-29 (de la Fuente et al, 2020), 25-34 (Dreger et al., 2014) or 25-44 (Gilmour, 2014)), which makes direct comparisons between studies challenging. Thus, our choice to focus on the 28-34 age range is informed by the data available and serves as a proxy for the broader, yet underexplored, group of young adults transitioning to full adulthood.

This age range is critical as it captures a phase in which individuals are establishing careers, relationships, and other life goals, all of which can influence mental well-being. NDIT and similar studies provide valuable data for examining mental health during this important transition period.

Additionally, the likelihood of developing common psychological issues (i.e., anxiety, depression) increases during adolescence and peaks in early adulthood at age 25 (Kessler et al., 2007). Studies report that sociodemographic variables explain 8% to 20% of the variance in well-being (Argyle, 2013; de la Fuente et al., 2020). Health status, physical activity, body image, sleeping, screentime, substance use, social support, violence, and discrimination have also been identified as associated with positive mental health (Dreger et al., 2014; Gilmour, 2014; Keyes, 2006; Winzer et al., 2014).

Table 2 summarizes a literature review exploring factors associated with mental well-being.

Table 2. Association of selected correlates with mental well-being in previous studies

Author(s), (year)	Country	Study design	Participants (age, n)	Method (^a name of study, ^b mental health measure, ^c analytic method)	Factors associated with PMH (effect size)	Factors not associated with PMH	Interpretation
Dreger et al. (2014)	Europe (34 countries)	Cross-sectional	Ages: 18+ N = 21 066 men and 22 569 women	^a European Quality of Life Survey (2011–2012) ^b Mental Well-Being Index (WHO-5) ^c Multilevel logistic regression analyses	Estimate: OR men; OR women Higher age: 1.27; 2.47 Lower education: 0.65; 0.76 No employment: 1.13; 1.27 Low religious practice: 1.08; 1.13 Low social support: 1.20; 1.29 Low levels of trust: 1.32; 1.43 High social exclusion: 1.69; 1.73 Living alone: 1.17; 1.18 Household problems: 1.40; 1.52 Neighborhood problems: 1.07; 1.13 Material deprivation: 1.93; 1.96 Financial problems: 1.33; 1.50 Low quality of public services: 1.39; 1.51	Estimate: OR men; OR women Urbanization level: 1.01 Citizenship: 1.01; 1.02 Social network: 1.03; 1.04 Political participation: 0.99; 1.03 Household tenure: 1.00	In the adjusted model, the strongest associations with poor PMH among both genders were observed for higher age, social exclusion and material deprivation. Moreover, living without a partner, lower education status, not working, practicing religion rarely or never, low social support, social exclusion and all material factors were significantly associated with poor PMH among both genders. Not having children was independently associated with poor PMH in women only.

Winzer et al. (2014)	Sweden	Cross-sectional	Ages: 19 – 26 N=18,274 men and 23,394 women	^a Swedish National Public Health Survey for the years 2004 to 2009 ^b General Health Questionnaire (GHQ-12) ^c Exploratory Factor Analysis	Estimate: Standardized coefficient SD units Female: -0.124 Age: -0.206 Employment: 0.149 Sickness/disability: -0.588 Emotional support: 0.340 Practical support: 0.261 Interpersonal trust: 0.171 Physical activity: 0.227 Gambling: 0.168 Humiliation: -0.397 Suicide ideation: -0.349	Estimate: Standardized coefficient in SD units Born in Europe: 0.052 Housing rented: -0.008 Community trust: 0.046 Smoking: -0.026 Violence: -0.015 Suicide attempt: -0.075	Gender (female), socio-economic factors (“poor” housing, sickness benefit/disability pension, economic strain), life-style factors (risky gambling), victimization (humiliation, threat, violence) and suicide ideation had positive crude associations with NMH
Van Lente et al. (2012)	Ireland	Cross-sectional	Ages: 18+ N=10,364	^a National Survey of Lifestyle, Attitudes and Nutrition (SLÁN 2007) ^b Energy and Vitality Index (EVI) from the RAND SF-36 questionnaire ^c Logistic regression	Estimate: OR (95% CI) Female: 0.63 (0.54-0.73) Urban: 0.75 (0.62-0.92) Lower social class: 1.32 (1.06-1.65) Poor social support: 0.50 (0.35-0.71) Loneliness: 0.27 (0.19-0.40) Higher age: 0.86 (0.66-1.12) Lower income: 0.89 (0.64-1.24)	Estimate: OR (95% CI) Community involvement : 0.95 (0.79-1.16)	Adjusted Positive mental health is predicted by lower levels of loneliness and higher levels of social support. Better self-rated health, positive health behaviours and lower GP consultation rates are associated with higher levels of positive mental health. Lower levels of social well-being, were found to be the strongest predictors of negative mental health Respondents with higher levels of positive mental

					Lower level of education: 0.82 (0.61-1.10) Employed: 1.11 (0.90-1.37)		health were more likely to report better self-rated health ($p < 0.001$), to be physically active ($p < 0.001$), less likely to smoke ($p = 0.001$)
Schotanus-Dijkstra et al. (2016)	The Netherlands	Cross-sectional	Ages: 18-64 N=5303	^a Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2) ^b Mental Health Continuum – Short Form (MHC-SF) ^c Pearson Correlation Logistic Regression	Estimate: OR (95% CI) Female: 1.27 (1.12–1.44) Education: 1.15 (1.07–1.24) Extraversion: 1.12 (1.10–1.15) Neuroticism: 0.90 (0.87–0.92) Conscientiousness: 1.11 (1.10–1.13) Social support: 1.40 (1.25–1.57) Positive life events: 1.20 (1.11–1.31)	Estimate: OR (95% CI) Age: 0.99 (.99–1.00) Living situation: 1.01 (0.86–1.19) Employment: 0.97 (0.82–1.14) Negative life events: 0.98 (0.91–1.06) Physical health status: 1.00 (1.00–1.01)	All factors associated were statistically significant ($p < 0.001$) The situational factors of social support and positive life-events were significantly associated with flourishing when the analysis was controlled for socio-demographics and personality traits
Gilmour (2014)	Canada	Cross-sectional	Ages: 15+ N = 25,113	^a Canadian Community Health Survey – Mental Health ^b Mental Health Continuum – Short Form ^c Logistic regression	Estimate: OR (95% CI) Age: 1.01 (1.01-1.02) Single: 0.7 (0.6-0.8) Lower education: 0.9 (0.8-1.0) Higher income: 1.3 (1.1-1.6) Inability to work: 0.5 (0.4-0.7) Spirituality: 1.6 (1.4-1.8) Chronic condition: 0.8 (0.7-0.9)	Estimate: OR (95% CI) Gender 1.0 (0.9-1.1) Immigrants 1.2 (0.9-1.6) Aboriginal status 0.9 (0.7-1.1)	Adjusted Age, marital status, socio-economic status, spirituality and physical health were associated with complete mental health. Men and women were equally likely to be in complete mental health.

					Chronic pain: 0.6 (0.5-0.7) Urban: 0.8 (0.7-0.9)		
Kelly et al. (2011)	Australia	Cross-sectional	Age: 18+ N=2462	^a --- ^b Aggregate measure of current well-being derived from levels of distress and related impairment (Kessler-10 LM), self-reported overall physical and mental health, functioning, satisfaction with relationships, and satisfaction with life ^c Hierarchical regression	Estimate: Pearson correlation, p<0.001 Neuroticism: -0.44 Divorced/separated: -0.16 Retired: 0.08 Inability to work: -0.22 Adverse events: -0.38 Social support: 0.35 Sense of community: 0.26	Estimate: Pearson correlation Age: 0.04 Gender: 0.03 Education: 0.05 Population change: 0.01 Regional socioeconomic ranking: 0.05 Drought severity index: 0.0	standardised regression weights The major contributing variables were dispositional factors (trait neuroticism, marital status), recent adverse events and indices of social support. No additional effects were detected for district-level variables (drought severity, regional socioeconomic categorisation, population change
Ganga et al. (2014)	India	Cross-sectional	Age:18-23 N=453	^a Achutha Menon Centre ^b Positive Mental Health Scale ^c Path model	Correlates of PMH identified based on their predictive power on the PMH score Sex Financial status of parents Quality of home learning environment Perceived parental care	---	According to the path model, the variables that have a direct determinant effect on PMH are: quality of home learning environment, employment status, education status, marital status, self-perception on possession of skills, happiness with life,

					Parenting by father Employment status Education status Marital status Self-perception on possession of skills Happiness with life Membership in social organizations Socializing capability.		membership in social organizations and socializing capability.
Ahrnberg et al. (2021)	Finland	Cross-sectional	Students age 14-16 N=195	^a --- ^b Warwick Edinburgh Mental Well-Being Scale (WEMWBS) ^c General linear model	Estimate: Beta coefficient Self-esteem: 0.789 Hope: 0.486 Kindness: 0.403 Experience of social inclusion: 0.096	Gratitude Family's socioeconomic factors	Analyses proceeded stepwise with reduction of variables that did not show statistically significant association with positive mental health (p<0.05)
Guo et al. (2018)	China	Cross-sectional	Students grade 8 and 10, age 13-16 N=5399	^b Mental Health Continuum – Short Form (MHC-SF) ^c Multivariate logistic regressions	Estimate: OR (95% CI) Female: 1.31 (1.13–1.52) Good family economy: 1.63 (1.33–2.00) Sibling: 1.32 (1.12–1.56) Satisfaction of self-appearance: 2.75 (2.15–3.51) High levels physical activity: 1.33 (1.16–1.54) Good sleep quality: 1.90 (1.64–2.20)	Estimate: OR (95% CI) Smoking habits: 1.09 (0.81–1.48)	Adjusted, p<0.05 The correlated factors of positive mental health in regression models included gender, perceived family economy, the occurrence of sibling(s), satisfaction of self-appearance, physical activity, sleep quality, stress, social trust, desire to learn, support from teachers and parents as well as whether being bullied at school.

					<p>Low stress: 1.41 (1.14–1.73) Social trust: 2.53 (2.18–2.93) Strong desire to learn: 1.48 (1.28–1.72) High teacher’s support: 1.43 (1.23–1.66) High parental support: 1.73 (1.49–2.00) Never bullied at school: 1.44 (1.25–1.66)</p>		
de la Fuente et al. (2020)	Spain	Cross-sectional	University students age 18-29 N = 1502	^b Flourishing scale ^c Linear regression	Estimate: Pearson correlations men – women Time of experimentation: 0.23-0.12 Feeling in-between: 0.36-0.22 Achieving good grades: 0.39-0.26 Friends: 0.38-0.27 Family: 0.42-0.24 Partner: 0.43-0.15	---	The effect size tests have also shown that having a job and living independently were not associated with flourishing
Almweisheer et al. (2023)	Canada	Cross-sectional	Adults with immune-mediated inflammatory disease, Age: 18+ N=598	^a Cohort study of adults with immune-mediated inflammatory disease ^b Mental Health Continuum – Short Form	Estimate: OR (95% CI) Age: 1.02 (1.01- 1.04) Anxiety: 0.25 (0.12-0.51) Depressive symptoms: 0.074 (0.009-0.61)	Estimate: OR (95% CI) Female: 1.59 (0.96-2.62) Race: 1.14 (0.64-2.02) Education: 1.26 (0.81-1.97)	Similar flourishing proportions across disease types. Older age was associated with a 2% increased odds of flourishing mental health per year of age. Clinically meaningful elevations in anxiety and depressive symptoms

				^c Logistic regression			were associated with lower odds.
Esteban et al. (2012)	Spain	Cross-sectional	N=5746 Age: 16-64	^a Health Survey of the City of Madrid (ESCM'05) ^b General Health Questionnaire (GHQ-12) ^c Logistic regression	Estimate: OR (95% CI) Women: 1.48 (1.23-1.78) Minors: 3.21 (2.40-4.29) Immigrant economic: 1.33 (1.06-1.68) Smoking: 1.22 (1.02 - 1.49) Drinking alcohol: 1.31 (1.09 -1.57) Chronic disease: 1.47 (1.21 -1.79) Sleeping less 8 hours: 1.41 (1.17 -1.68) Having fair or poor health status perception: 1.65 (1.22-2.22) Self-perceived poor quality of life: 1.18 (1.15-1.22) Limited social activities: 1.34 (1.07 - 1.69)	---	p <0.05 for gender, age group 16 to 24 years and lower social classes These are predictors most strongly associated with poor mental health
Nomaguchi and Milkie (2003)	United States	Cross-sectional	Adults in childbearing years Age : 18-44 N = 6370	^a Nationally representative panel ^b Psychological well-being ^c Ordinary least squares regressions	Estimate: Beta coefficient (SE) Living with a child: 0.04 (0.13) Female parent: -0.52 (0.12)* Unmarried parent: 0.72 (0.17)* *p<0.001	---	The effects of parental status on adults' lives vary markedly by gender and marital status. Unmarried parents report lower self-efficacy and higher depression than their childless counterparts. Married mothers' lives

							are marked by more housework and more marital conflict but less depression than their childless counterparts. Parental status has little influence on the lives of married men.
Capaldi, Varin, et al. (2021)	Canada	Cross-sectional	Highschool students, age: 12-18 N=37,897	^a Canadian Student Tobacco, Alcohol and Drugs Survey (CSTADS) ^b Eudaimonic well-being: Psychological and social well-being ^c Linear regression	Estimate: Beta coefficient (95% CI) Female: -0.11 (-0.19; -0.03) Grade: -0.30 (-0.33; -0.28) Urban: -0.33 (-0.43; -0.23) Being bullied: -4.20 (-4.34; -4.05) Bullying others: -0.68 (-0.88; -0.49) Behavioral problems: -0.43 (-0.45; -0.42) Cigarette use: -1.95 (-2.14; -1.75) e-cig smoking: -0.41 (-0.58; -0.24) Cannabis use: -1.39 (-1.60; -1.19) Prosocial behaviour: 0.35 (0.34; 0.35)	Estimate: Beta coefficient (95% CI) Alcohol use : -0.04 (-0.16 ; 0.08)	Adjusted, p<0.001 Recent alcohol use was not significantly associated with PSWB in the overall sample, but a significant negative association between recent alcohol use and PSWB was found for male students and a significant positive association between these variables was found for female students
Low (2011)	Unites States	Cross-sectional	Undergraduate students, age : --- N= 428	^a CIRP Freshman Survey ^b Mental Health Continuum – Short Form	Estimate: t-test; p-value Community engagement: t[78]=-2.3; p=0.03	Estimate: p-value Marijuana use: 0.58 Alcohol drinking: 0.77	There were no significant differences in alcohol consumption, cigarette smoking, marijuana use, or hours of volunteer work based on mental health category. Alcohol

				^c ANOVA and two-way chi square			consumption and binge drinking were not associated with measures of mental health. However, certain kinds of student engagement were associated with flourishing
Monteiro et al. (2021)	Portugal	Cross-sectional	Postpartum women (mean age 32.05) N=661	^a Online Survey ^b Mental Health Continuum – Short Form ^c Logistic regression	Estimate: OR (95% CI) Employment: 1.65 (1.11–2.45) Physical health: 0.55 (0.29–1.05) History of psychopathology: 0.42 (0.30–0.60) Maternal confidence: 9.08 (5.33–15.49) Self-compassion: 1.20 (1.17–1.24) Psychological flexibility: 1.14 (1.12–1.17) Resilience: 1.13 (1.11–1.16) Infant’s sleep problems: 0.40 (0.25–0.63)	Estimate: OR (95% CI) Age: 1.02 (0.99–1.06) Marital status: 1.04 (0.61–1.79) Education: 1.10 (0.85–1.41) Household income: 0.98 (0.79–1.20) Primiparous: 0.88 (0.64–1.21)	Unadjusted Higher scores in the MHC-SF and the presence of flourishing were significantly and largely associated with higher satisfaction with life, higher quality of life and higher resilience. A significant association was also found between lower postpartum depressive symptoms and higher scores on the MHC-SF
Clayborne et al. (2023)	Canada	Cross-sectional	Age: 12+ N=18,683	^a Canadian Community Health Survey – Annual Component (2015)	Estimate: OR range Sleep quality: 1.52–4.24 Sleep duration: 1.27–1.56	---	Adjusted Good sleep quality was associated with higher odds of PMH. Meeting sleep duration recommendations was positively associated with PMH indicators,

				^b High self-rated mental health ^c Logistic regression			but some associations did not remain significant when stratified.
Dai et al. (2020)	Canada	Cross-sectional	Ages: 18+ N=42,600	^a Canadian Community Health Survey (CCHS) (2011-2012) ^b Health-risk behaviors and psychological well-being ^c Logistic regressions	Estimate: OR (95% CI) Extreme sleep durations: 3.24 (2.45-4.29) Insomnia symptoms: 3.99 (3.35-4.74)	---	After multivariate adjustment, extreme sleep durations and insomnia symptom were still independently associated with increased odds of all health-risk behaviors and worse psychological well-being. Health risk behaviours included : physical activity, cigarette smoking, sedentary time, intake of fruit and vegetable. Psychological wellbeing included self-rated general and mental health, sense of belonging and life satisfaction.
Bang et al. (2020)	Canada	Cross-sectional	Ages: 5 – 17 N=4250	^a Canadian Health Measure Survey (CHMS) ^b The Strengths and Difficulties Questionnaire (SDQ) and General mental health	Estimate: OR (95% CI) Adherence to the 24-Hour Guidelines: Two or more recommendations met: 3.10 (1.17-8.19) Sleep recommendation met: 1.88 (0.98-3.62)	Estimate: OR (95% CI) Only one recommendation met: 1.00 (0.48-2.08) Physical activity recommendation met: 0.84 (0.42-1.68)	Meeting two or more of the 24-Hour Movement Guidelines recommendations was associated with an increased likelihood of positive psychosocial health among youth. Sleep duration and screen time were strongly associated with

				^c Logistic regressions	Screen time recommendation met: 2.64 (1.21-5.73) Sleep and physical activity: 3.04 (1.33-6.98)		social behaviour and psychosocial health among Canadian youth. Adherence to the 24-Hour Guidelines was significantly associated with better psychosocial health among Canadian youth.
Weatherson et al. (2020)	Canada	Cross-sectional	Students grades 9 – 12 N=29,133	^a COMPASS Study (2017-2018) ^b Flourishing scale ^c Generalized linear models	Estimate: Beta coefficient (95% CI) MVPA: 0.39 (0.33-0.44) Sleep: 1.05 (0.98-1.12) Screen time: 1.12 (0.99-1.24)	---	Adjusted for age, sex, ethnicity Flourishing, low depressive youth most likely to meet screen time and sleep guidelines. Flourishing youth more likely to meet physical activity guideline.
Nogueira et al. (2022)	Portugal	Cross-sectional	University students, age : 17-36 N=3322	^b Positive Mental Health Questionnaire ^c Linear regression	Estimate: Beta coefficient; p-value Gender: 0.034; 0.012 Age: 0.040; 0.015 Regular exercise: 0.042; 0.002 Healthy diet: 0.091; 0.00 Meals per day: 0.040; 0.004 Leisure activities: 0.048; 0.00 Psychological vulnerability: -0.593; 0.00	---	Gender, age, regular exercise, healthy diet, number of meals per day, and leisure activities are significant positive predictors of PMH. Psychological vulnerability is the sole significant negative predictor.
Nandasena et al. (2023)	Sri Lanka	Cross-sectional	Nursing students	^a ---	Estimate: p-value	Estimate: p-value	Students who engaged in leisure activities and

			(mean age 23.5) N=170	^b Mental Health Continuum – Short Form ^c Chi square test	Leisure activities: 0.04 Social activities: 0.008 Physical health: 0.021 Mental health: 0.013 Family member health status: 0.007	Age: 0.126 Sex: 0.407 Religious activities: 0.691	social activities were more flourished whereas students who are diagnosed with chronic illness/es, mental illness/es and had any family member/s suffering with a severe illness/es were more languished.
Vinko et al. (2022)	Slovenia	Longitudinal	Age: 15+ N=9900	^a European Health Interview Survey (EHIS) & Survey on the impact of the pandemic on life (SI-PANDA) ^b Mental Health Continuum – Short Form ^c Logistic regression	Estimate: OR (95% CI) Higher education: 1.47 (1.09-1.98) Employment: 1.02 (0.70-1.50) Being single: 0.48 (0.36-0.64) Resilience: 1.34 (1.26-1.41) Health literacy: 1.11 (1.01-1.22) Improved family relations: 1.35 (1.08-1.68) Financial security: 1.47 (1.07-2.01) Worsened social interaction: 0.66 (0.54-0.82) Worsened physical activity: 0.78 (0.63-0.95) Worsened sleep: 0.66 (0.52-0.84) Worsened diet: 0.61 (0.46-0.82)	Estimate: OR (95% CI) Chronic conditions: 0.99 (0.81-1.21)	Resilience, COVID-19 literacy and changes in family relations, social interactions, and dietary habits were associated with both flourishing and languishing mental health

Schotanus-Dijkstra et al. (2017)	Netherlands	Longitudinal	Age :18-64 N=4482	^a Netherlands Mental Health Survey and Incidence Study-2 (NEMESIS-2) ^b Mental Health Continuum – Short Form ^c Logistic regression	Estimate: OR (95% CI) Mood disorders: 0.72 (0.54–0.96) Anxiety disorders: 0.47 (0.34–0.64)	Estimate: OR (95% CI) Substance use disorder: 0.71 (0.48–1.05)	Flourishing reduced the risk of incident mood disorders by 28% and of anxiety disorders by 53%, but did not significantly predicted substance use disorders. Significant results were found for substance use disorders when life-events and social support were removed as covariates.
O'Connor et al. (2017)	Australia	Longitudinal	Age : 15-16 to 27-28 N=999	^a Australian Temperament Project ^b Seligman's PERMA framework (positive emotional experiences, engagement, relationships, purpose, and accomplishment), with the addition of health ^c Logistic and linear regressions	Estimate: Beta coefficient (SE) Education: 0.21 (1.33-0.24) Job competence: 0.11 (0.11-0.27) Volunteering: 0.09 (0.12-0.06)	Estimate: OR (95% CI) Marital status: 0.69 (0.39-1.21)	Positive mental health at 15–16 years was associated with indicators of career progression (educational attainment and perceived competence) and taking on citizenship responsibilities (volunteering and civic activities) over a decade later at 27–28 years. No significant associations between positive mental health in adolescence and relationship outcomes in young adulthood observed
Uecker (2012)	United States	Longitudinal	Ages: 18 – 28 N=15,197	^a National Longitudinal Study of Adolescent	Estimate: OR, p<0.001 Being single: 0.43	---	Adjusted for age, gender, region, urbanicity, race, body mass index

				Health (Add Health) ^b Psychological distress and life satisfaction ^c Ordinary Least Squares Regression Models			classification, attractiveness and employment. Married young adults, especially those who first married at ages 22 to 26, report higher life satisfaction than those in other type of romantic relationships, those in no romantic relationship, and those who married prior to age 22.
Doré et al. (2018)	Canada	Longitudinal	CEGEP students N=430	^a --- ^b The Mental Health Continuum-Short Form ^c Multivariate linear regressions	Estimate: Beta coefficient (95% CI) Group physical activity: 2.24 (0.01-4.46) Team sports: 3.39 (0.74-5.59)	---	Relative to individual PA, informal group PA and team sports were positively associated with positive mental health.
Howard et al. (2023)	Australia	Longitudinal	Ages: 18-34 2018: n= 5,346 2002: n= 3,633 2010: n= 3,945	^a The Household, Income and Labour Dynamics in Australia (HILDA) ^b The Short Form 36 mental health and wellbeing scale	Estimate: Beta coefficient (95% CI) Living with parents: -5.65 (-9.41- -1.89)	---	The greatest differential in mental health between co-resident and independent young adults is observed amongst those for whom rates of co-residence have increased most dramatically, i.e., females and older adults (30-34 years old)

				^c Weighted linear regression model			
Paul and Moser (2009)	USA, UK, Germany, Australia, Finland, Canada, Netherlands, Ireland, Austria, Sweden, Italy, New Zealand, Denmark, India, Norway, Israel, France, China /Hong Kong, Mexico, Belgium, Turkey, Chile, Spain, Japan, Greece, Switzerland	Meta-analyses : 237 cross-sectional and 87 longitudinal studies	Unemployed individuals, age: --- N = 458,820	^b Mental health: (1) Mixed symptoms of distress, (2) depression, (3) anxiety, (4) psychosomatic symptoms, (5) subjective well-being, (6) self-esteem	Employment	---	The average overall effect size was $d = 0.51$ with unemployed persons showing more distress than employed persons. A significant difference was found for several indicator variables of mental health (mixed symptoms of distress, depression, anxiety, psychosomatic symptoms, subjective well-being, and self esteem)
Gedikli et al. (2023)	Developed economies (e. g., EU-15 countries, UK, US,	Meta-analysis of longitudinal studies	---	^a 46 samples reported in 29 studies published between 1990 and 2020	Employment	---	Results present a negative relationship between unemployment and life satisfaction, stronger for men than women, and the longer the duration of

	and Australia)			^b Mental health and subjective well-being ^c ---			unemployment, the larger the impact.
VanderWeele (2017)	United States	Review of longitudinal, experimental and quasi-experimental studies	Adults	^b Flourishing: mental & physical health, happiness & life satisfaction, meaning & purpose, character & virtue, and close social relationships	Marital status Employment Religion Education	---	Four major pathways (family, work, education, and religious community) are both relatively common and have reasonably sizeable effects on each of the aforementioned domains of flourishing.

N: Sample size

PMH: Positive Mental Health

NMH: Negative Mental Health

WHO-5: The World Health Organization-Five Well-Being Index

PSWB: Psychological and social well-being

PA: Physical Activity

Table 2 highlights a diverse array of factors associated with positive mental health among adults across a range of studies, most of which are cross-sectional. While longitudinal studies are relatively rare, the few available offer deeper insights into the temporal relationships between variables like employment and positive mental health. Meta-analyses, such as those by Gedikli et al. (2023) and VanderWeele (2017), provide valuable syntheses, suggesting that employment consistently supports better mental health and flourishing, a particularly compelling finding. Overall, key factors linked to positive mental health include strong social support, higher income, regular employment, physical activity, good sleep quality, and personality traits like extraversion. In contrast, factors such as urbanization and citizenship, and behaviors such as smoking and alcohol consumption have generally been found to have no association with positive mental health, although the relationship between smoking and alcohol use may differ across specific populations or depending on the specific patterns of use. Comparing findings is challenging due to variability in study designs, sample sizes, and the specific variables examined. Notably, the table does not include clinical sample studies, which may present different associations due to the specific mental health conditions they address. The meta-analyses are especially interesting as they attempt to summarize the field but may still fall short of addressing the nuances of individual studies. Despite these challenges, the general impression is that social, psychological, economic stability, and health-promoting behaviors are central to fostering positive mental health. This broad consistency across studies points to a multifaceted construct influenced by personal, social, and environmental factors.

2.7 Gaps in Knowledge

In recent years, the field of mental health promotion has acquired recognition world-wide as a critical public health imperative. Positive mental health can be advanced through surveillance data, research, and evaluation of public health efforts (Fanslow, 2009). In terms of research, the literature on positive mental health suggests a lack of definitional clarity (e.g., studies have disagreed on ways to transform an abstract concept, such as emotional well-being, into variables that can be observed, manipulated and measured (Necka et al., 2023)) and a scarcity of studies targeting a wide range of correlates, especially among young adults. This ultimately leads to lack of effective strategies to enhance positive mental health.

Few studies use a comprehensive measure of positive mental health encompassing all dimensions of hedonic and eudemonic approaches of well-being (e.g., Keyes, 2005; Salama-Younes, 2011; Gilmour, 2014). The lack of consensus on how to define concepts related to positive mental health is problematic since it impedes comparison across studies. For example, while it is widely acknowledged that achieving good mental health is important, it is unclear which core domains should be assessed in research. In using the Mental Health Continuum, a comprehensive measure encompassing emotional, psychological and social well-being, the current study provides a more holistic assessment of positive mental health drawing on current definitions and evidence in the field.

Although new research on positive mental health is rapidly emerging, many areas lack development, and one such area is the identification of factors associated with positive mental health, specifically among young adults. The scarcity of studies on young adults is problematic since they are among the most vulnerable to the impact of poor mental health and emerging mental disorders (Fusar-Poli, 2019). In addition, few studies report the distribution of positive mental health over a wide range of personal characteristics and behaviours. This thesis will provide a population-level glimpse of flourishing mental health's association with sociodemographic, lifestyle and psychological factors among young adults in Canada. Identifying possible correlates of positive mental health is essential to develop hypotheses about causes of positive mental health and to inform the development of programs and policies with the potential to be effective.

Chapter 3 Objective

The objective of the current study was to identify, from among a wide range of potential correlates, sociodemographic, lifestyle, and psychological factors associated with flourishing mental health in young adults ages 28-34 years.

Chapter 4 Methods

This thesis comprises an analysis of data collected in the Nicotine Dependence in Teens (NDIT) Study. This chapter describes the original objectives of NDIT, its study design, the methods of sampling high schools and student within high schools, and how data were collected. It then describes the study design, the study variables, and the methods of data analysis employed in the current study.

4.1 NDIT Study Design and Sampling

The NDIT study is an ongoing longitudinal investigation in which the original primary objective was to study the natural course and determinants of cigarette smoking and nicotine dependence in novice smokers (O’Loughlin et al., 2015). In addition to its primary objectives, NDIT data have been used to investigate diverse topics related to obesity, blood pressure, physical activity, team sports, sedentary behaviour, diet, genetics, alcohol use, use of illicit drugs, second-hand smoke, gambling, sleep and mental health.

Participants were recruited in 1999-2000 using a school-based sampling strategy. Thirteen schools were purposely selected to include a mix of schools based on language (French/English), location (urban/suburban/rural) and socioeconomic status (high/moderate/low). Three of the 13 schools were excluded – two schools had low parental consent and one school could not guarantee continued participation of the same students throughout the five years of high school. All grade 7 students in the 10 high schools retained were invited to participate (n = 2325). A total of 1294 participants (mean (SD) age = 12.8 (0.6) years) were recruited - a response proportion of 56%.

Most data were collected in self-report questionnaires, although NDIT also collected DNA samples, anthropometric measures, blood pressure measures, and accelerometer data. Self-report questionnaires were completed by NDIT participants every 3 months during the 10-month school year (i.e., September to June) from 1999 until 2005, for a total of 20 data collection cycles during high school. Post-high school, participants completed self-report questionnaires in 2007-08 (cycle 21), 2011-12 (cycle 22), 2017-20 (cycle 23) when participants were age 20.4 (0.8), 24.0 (0.7), and 30.6 (1.0) years on average, respectively. During and after the COVID-19 pandemic, data were collected in 2021 (cycle 24) and 2022 (cycle 25). As indicated by the red circle in Figure 3, data

for the current analyses were drawn primarily from cycle 23, with additional descriptive data drawn from cycle 1 (i.e., at NDIT inception). A total of 799 participants (56.1% female) completed the questionnaire in cycle 23 (i.e., 61.8% of the 1294 NDIT participants at inception).

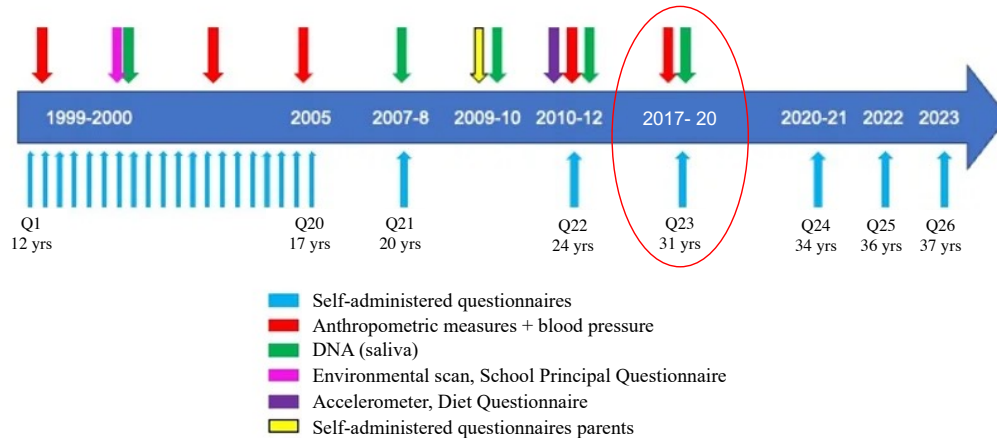


Figure 3. NDIT study data collection timeline from 1999-2023*

*Red circle denotes the data collection cycle of primary interest in the current study.

4.2 Ethical Considerations

At NDIT inception, a parent or legal guardian provided informed consent and NDIT participants provided assent. Post high school, participants (who had all attained legal age) provided informed consent. NDIT received ethics approval from the Montreal Department of Public Health Ethics Review Committee, the McGill University Faculty of Medicine Institutional Review Board, the Ethics Research Committee of the Centre de Recherche du Centre Hospitalier de l'Université de Montréal and the University of Toronto [APPENDIX B]. Data collection for cycle 23 was approved by the Ethics Research Committee of the Centre de Recherche du Centre Hospitalier de l'Université de Montréal.

4.3 Study Variables

The “outcome” variable of interest in this thesis was positive mental health. Potential correlates of positive mental health investigated included 21 sociodemographic, lifestyle and psychological indicators.

4.3.1 Positive mental health

Positive mental health was measured in NDIIT using the short form of the Mental Health Continuum (MHC-SF). The MHC-SF, which is used in research, surveillance, and clinical settings, has at least two important advantages over other similar well-being measures - it is relatively short and it examines three components of positive mental health (Burns & Fardfini, 2021). Specifically, it includes 14 items which measure the frequency with which each item was experienced in the past month, three of which measure emotional well-being, six measure psychological well-being, and five measure social well-being (

Table 3). Response options for all items are coded on the 6-point Likert scale ranging from never (scored 0) to always (scored 5). The total score distinguishes three levels of positive mental health: flourishing, moderate and languishing (Keyes, 2007; Lamers et al., 2011). Flourishing mental health is defined as experiencing at least one of three emotional well-being items and at least six of 11 psychosocial functioning items (social and psychological well-being) always or most of the time during the past month. Languishing mental health is defined as experiencing at least one of three emotional well-being items and at least six of 11 psychosocial functioning items never or rarely during the past month. People with moderate mental health are neither flourishing nor languishing (Lamers et al., 2011).

Table 3. Three well-being components of the Mental Health Continuum Short Form (MHC-SF)

Well-Being Components		
Emotional 3 items (Items 1-3)	Social 5 items (Items 4-8)	Psychological 6 items (Items 9-14)
Happy Interested in life Satisfied with life	Social contribution Social integration Social actualization Social acceptance Social coherence	Self-acceptance Environmental mastery Positive relation with others Personal growth Autonomy Purpose in life

Confirmatory factory analysis supports the correlated 3-factor structure of the MHC-SF in both the French and English versions of the scale, as well as its invariance across sex (Doré et al., 2017; Orpana et al., 2017). In previous work, the internal consistency of the subscales and the reliability were relatively high according to Cronbach's alpha coefficient (>0.70 for all three subscales) and Jöreskog's rho (0.79 to 0.90) (Doré et al., 2017). The Cronbach's alpha of the MHC-SF subscales

in NDIT are 0.91, 0.84 and 0.90 respectively. As suggested by numerous authors (Gilmour, 2014; Guo et al., 2018; Hori et al., 2019; Keyes, 2007), we categorized participants into one of two categories - flourishing or non-flourishing (i.e., which included moderate and languishing) mental health in this thesis. Data for the MCH-SF were available for the first time in cycle 23 in NDIT.

4.3.2 Potential Correlates

Potential correlates of positive mental health were selected based on a review of existing studies that focus on factors consistently associated with mental well-being in the general population. This literature review identified key variables (e.g., coping skills, physical activity, employment) which are frequently linked to positive mental health (e.g., Dreger et al., 2014; Gilmour, 2014; Keyes, 2005; Schotanus-Dijkstra et al., 2016). The selection of these potential correlates was guided by their theoretical relevance to the research objectives, as well as the availability of data in the NDIT dataset. Only those variables that were supported by the existing literature and measured in NDIT were included in the analysis, ensuring a balance between theoretical grounding and feasibility. The potential correlates investigated in this study are displayed in Table 4.

Table 4. Potential correlates of positive mental health investigated in this MSc thesis, NDIT, 1999-2020

Sociodemographic factors	Lifestyle factors	Psychological factor
Age*	Cigarette smoking	General coping ability
Sex	Marijuana, cannabis or hashish use	Depressive symptoms
Lives alone	Binge drinking	Anxiety symptoms
Lives with children	Team sports participation	
Lives with parent	MVPA	
Marital Status	Sleep quality	
Attended university	Screen for work/school*	
Currently a student	Screen for leisure time*	
Currently employed		
Annual household income		

Abbreviations: MVPA, Moderate to Vigorous Physical Activity; NDIT, Nicotine Dependence in Teens

*Used as continuous variables

Sociodemographic variables included age, sex, living alone (yes/no), living with children (yes/no), living with parents (yes/no), attended university (yes/no), currently a student (yes/no), marital status (Single/married/living as married/divorced/separated), currently employed (yes/no) and income (<\$30,000/\$30,000 to \$99,999/ >\$100,000/don't know).

For **age**, participants provided their date of birth and the date when the questionnaire was completed. Age (in years) was computed as a continuous variable by subtracting the participant's birth date from the date of data collection.

At NDIT inception in cycle 1, participants were asked: *Are you a boy or a girl?* Based on this response and verification in subsequent cycles, **sex** was categorized as male or female. Data on gender were collected in subsequent cycles. However too few participants self-reported other than male or female to warrant a separate category.

Living alone, living with children, and living with parents were measured by asking: *Do you currently live alone?* (yes, no). If participants responded no, they were then asked to identify household members by answering yes or no to: living with biological mother, biological father, step-mother, step-father, sister(s)/step-sister(s)/half-sister(s), brother/step-brother(s)/half-brother(s), husband/wife, partner, son(s)/step-son(s), daughter(s)/step-daughter(s), roommate(s) and specify any other if available. Those who responded yes to living with biological mother/biological father/stepmother/stepfather were categorized as living with parents (yes, no). Participants who responded yes to living with son(s)/stepson(s)/daughter(s)/stepdaughter(s) were categorized as living with children (yes, no).

Marital status was measured by: *What is your current marital status?* Response options included single, married, living as married (common-law), divorced, separated, or other. **Being in a relationship** was coded yes (i.e., married (common law), other) or no (i.e., single, divorced, separated).

Education was measured by: *How far have you gone in school?* Response options included attended high school but did not graduate, graduated high school, attended CEGEP, community/technical college, graduated CEGEP, community/technical college, attended university (or teachers college) but did not graduate, graduated university with a Bachelor's degree, graduated university with a Master's degree or graduated university with a PhD. Participants were then categorized as attended university (yes, no).

Participants were asked: *Are you currently enrolled as a full- or part-time student?* with no, yes, full time, yes, part time as response choices. Participants who responded yes, full time or yes, part time were coded as **currently a student** (yes, no).

Currently employed was measured by: Are you currently working at a job or business (paid or unpaid)? (yes, no).

Annual household income was measured by: What is your best estimate of the total income, before taxes and deductions, of all household members from all sources in the past 12 months?. Response options included: less than \$20,000 (1), \$20,000 - \$29,999 (2), \$30,000 – 39,999 (3), \$40,000 – \$49,999 (4), \$50,000 - \$59,999 (5), \$60,000 - \$69,999 (6), \$70,000 - \$79,999 (7), \$80,000 - \$99,999 (8), \$100,000 - \$119,000 (9), \$120,000 - \$149,000 (10), \$150,000 or more (11), don't know (12). Responses were recoded into four categories: <\$30,000, \$30,000 to \$99,999, >\$100,000, and don't know.

Lifestyle factors measured included cigarette smoking, use of cannabis, binge drinking, team sports participation, moderate to vigorous intensity physical activity (MVPA), sleep quality and screen time. Participants were asked how often they had smoked cigarettes in the past year with responses ranging from never to everyday. **Daily cigarette smoking** (yes, no) was coded yes if participants responded that they had smoked every day in the past year.

Daily **cannabis use** (yes, no) was assessed by asking participants how often they used marijuana, cannabis or hashish with and without tobacco in the past-year. Response options ranged from never to everyday. Participants who used cannabis everyday were categorized as yes.

Weekly/daily binge drinking (yes, no) was assessed by asking participants how often they drank five or more alcoholic beverages on one occasion in the past-year. Response options ranged from never to everyday. Participants who reported that they binge drank daily or weekly were categorized as yes. Those who reported never, less than monthly or monthly in the past year were re-coded as no.

To measure **team sports participation** (yes/no), participants were asked: In the past 12 months, how many organized sports teams did you belong to (where you practice with teammates or play against other teams)? Team sports participation was categorized as yes if participants reported that they had belonged to ≥ 1 team sport.

Meeting physical activity guidelines (yes/no) was measured using the short version of the International Physical Activity Questionnaire (IPAQ-SF), a 6-item questionnaire that measures minutes spent in vigorous intensity physical activity (VPA), moderate intensity physical activity (MPA) and walking over the last 7 days (Craig et al., 2003). VPA data were obtained by asking participants: *During the last 7 days, on how many days did you do vigorous physical activities (heavy lifting, digging, acrobatics, fast bicycling) for at least 10 minutes at a time?* and *On the days that you did vigorous physical activity, how many minutes did you usually spend per day?* Similar questions were asked to obtain data on MPA and walking. As per IPAQ data processing recommendations, NDI variables were truncated at 180 minutes per day, for a maximum of 1260 minutes (21 hours) of each activity per week. Total minutes of VPA and MPA reported in the past week was obtained by multiplying the number of days reported for moderate-vigorous intensity physical activities (MVPA) by number of minutes on these days. Participants who accumulated 150 minutes of MVPA were categorized as meeting MVPA recommendation (Canadian Society for Exercise Physiology CSEP). The IPAQ-SF has a good test re-test reliability ($r = 0.80$) (Craig et al., 2003).

Sleep quality (high/low) was measured by: *In general, how would you rate the quality of your sleep in the past month?* Response options ranged from poor to excellent. Participants were categorized into two groups including those who reported good to excellent sleep and poor to fair sleep.

Data on **average weekly work/school screen time** (hours/week) were collected for weekdays and weekends separately. Participants reported how many hours per day they usually spend in front of a screen (computer, hand-held device) for work or for school. The questions were adapted from the Ontario Student Drug Use and Health Survey (OSDUHS)(Boak et al., 2013). Data for

weekdays and weekends were summed to obtain the total time spent per week for screen time in each category. Weekly work/school screen time was used as continuous variables in this analysis.

For **meeting leisure screen time guidelines** (yes, no), participants reported how many hours per day, during leisure time, they usually spend in front of a screen (computer, TV, hand-held device). Participants who reported less than three hours of recreational screen time across both weekdays and weekends were recoded as meeting guidelines. Those who reported three hours or more on weekdays and/or weekends were recoded as not meeting guidelines.

Psychological variables included ability to cope, depressive and anxiety symptoms. For **ability to cope**, participants responded to two items, each with a 5-point Likert-type response scale ranging from poor to excellent (Canadian Community Health Survey) (CCHS, 2015). The two items were ability to handle unexpected and difficult problems and ability to handle the day-to-day demands of life. Scores on the two items were averaged to create a variable ranging from 1 to 5.

Depressive symptoms were assessed using the Major Depression Inventory (MDI), a 10-item scale that scores self-reported frequency of depressive symptoms experienced in the past two weeks (Bech et al., 2001). Responses ranged from at no time to all the time (for a total of 50 points) with higher scores indicative of a higher frequency of depressive symptoms (Bech et al., 2001). Scores of 20, 25 and 30 represent cut points for mild, moderate and severe depression (Bech et al., 2001). For this analysis, participants with scores >20 were categorized as having moderate/severe levels of depressive symptoms. Those with scores ≤ 20 were categorized as having mild depressive symptoms (no moderate/severe). The MDI scale has been validated and is reliable in adults ($\alpha = 0.94$) (Bech et al., 2001). The Cronbach's alpha coefficient was 0.89 in NDIT.

Anxiety symptoms were assessed using the General Anxiety Disorder (GAD-7) questionnaire (Spitzer et al., 2006). GAD-7 includes seven items measuring the frequency of anxiety symptoms over the past two weeks, with response options ranging from not at all to nearly every day. Higher scores indicate more frequent anxiety symptoms. Scores of 5, 10, and 15 represent cut points for mild, moderate, and severe anxiety symptoms, respectively (Spitzer et al., 2006). Participants were categorized into moderate to severe anxiety symptoms (yes/no). The GAD-7 has demonstrated

good internal consistency and test-retest reliability, with a Cronbach alpha of 0.92 and an intraclass correlation of 0.83 (Spitzer et al., 2006).

Complete details on all study variables including the item(s) used to measure the variable, the original response options, re-coding of responses for analysis, measures of internal consistency for scales, and references if applicable are provided in Table S1.

4.4 Data Analysis

Of the 1294 participants who completed cycle 1, 792 (61%) reported data on positive mental health in cycle 23 and were retained for analysis. In preliminary descriptive analyses, we checked for missing data, identified outliers and assessed the nature of the distribution of each study variable. Categorical variables were examined in frequency distributions. Depending on the distribution of continuous variables, means and standard deviation (SD) or medians and interquartile range (IQR) were computed. Because of few missing data in cycle 23 (i.e., 0% - 8% of participants were missing data on any single variable), we did not impute missing values.

We investigated the association between each potential correlate and positive mental health as an independent study that addressed a specific hypothesis, which helps reduce issues related to multiple testing and minimizes errors in hypotheses about how potential correlates relate one to the other. Testing each hypothesis involved only three tests: an unadjusted model (model 1), a minimally adjusted model (model 2) which included a common set of covariates (i.e., age and sex) across models, and a fully adjusted model (model 3) adding covariates specific to the potential correlate of interest in addition to age and sex (e.g., (Dugas et al., 2014; Struik et al., 2022; Wellman et al., 2014). For each variable, the sample size was consistent across all models (Model 1, Model 2, and Model 3). However, the sample size could differ between variables due to missing data. This approach ensured that each hypothesis is tested with the maximum data available for each variable while maintaining consistency across models for a given variable.

All statistical analysis were conducted using R software version 4.1.3.

Chapter 5 Results

5.1 Manuscript Presentation and Contributions

This chapter presents a manuscript entitled Sociodemographic, lifestyle and psychological factors associated with positive mental health in young adults. The journal targeted for publication is the Canadian Journal of Psychiatry. As first author, the candidate took the lead in all aspects of manuscript preparation including synthesizing the literature, developing the study objectives and design, conducting data analysis and writing the manuscript. Isabelle Doré and Jennifer O’Loughlin supervised the project, participated in analytic decisions, and reviewed and edited the manuscript.

5.2 Manuscript

Target Journal: Canadian Journal of Psychiatry

Title: Sociodemographic, lifestyle and psychological factors associated with flourishing mental health in young adults

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Conflict of interest: The authors declare no conflict of interest.

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Ethics approval: NDIT was approved by Centre de recherche du Centre Hospitalier Universitaire de Montréal (CRCHUM) ethics committee.

Consent to participate: Informed consent was provided by participants (who had all attained legal age) in NDIT cycle 23.

Consent for publication: Not applicable

Availability of data and material/Code availability: Access to NDIT data is open to any university-appointed or affiliated investigator upon successful completion of the application process. Masters, doctoral and postdoctoral students may apply through their primary supervisor. To gain access, applicants must complete a data access form and return it to the principal investigator (jennifer.oloughlin@umontreal.ca). The procedure to obtain access is described in O’Loughlin, J., Dugas, E. N., Brunet, J., DiFranza, J., Engert, J. C., Gervais, A., Gray-Donald, K., Karp, I., Low, N. C., Sabiston, C., Sylvestre, M. P., Tyndale, R. F., Auger, N., Belanger, M., Barnett, T., Chaiton, M., Chenoweth, M. J., Constantin, E., Contreras, G., Kakinami, L., Labbe, A., Maximova, K., McMillan, E., O’Loughlin, E. K., Pabayo, R., Roy-Gagnon, M. H., Tremblay,

M., Wellman, R. J., Hulst, A., Paradis, G., 2015. Cohort Profile: The Nicotine Dependence in Teens (NDIT) Study. *Int J Epidemiol.* 44(5), 1537-1546. doi: 10.1093/ije/dyu135.

Author contributions:

1. Development and funding of NDIT JOL
2. Developed design for this study JOL, ID
3. Data analysis ID, YD
4. Wrote sections of the paper JOL, ID, YD
5. Reviewed the article JOL, ID
6. Takes full responsibility for all the article JOL, ID

Yasmien Deis, Jennifer O'Loughlin and Isabelle Doré contributed to the current study conception and design. Data analyses were performed by Yasmien Deis. The first draft of the manuscript was written by Yasmien Deis and all authors commented on versions of the manuscript. All authors read and approved the final manuscript.

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Number of References: 70

Abstract

Objective: To identify sociodemographic, lifestyle and psychological correlates of flourishing mental health (i.e., feeling good and functioning well) in a population-based sample of young adults.

Methods: Data for this cross-sectional study were drawn from the ongoing Nicotine Dependence in Teens (NDIT) study, Québec, Canada. Of 799 participants in cycle 23, 792 (mean (SD) age = 30.6 (1.0) years) provided data on positive mental health using the short form of the Mental Health Continuum (MHC-SF) and were retained for analysis. Each potential correlate was studied in an unadjusted model, a model adjusted for age and sex, and a model adjusted for age, sex and other covariates related to the specific correlate of interest.

Results: Of 792 participants retained for analysis, 39.4% (39.9% of females; 38.8% of males) reported flourishing mental health. Variables associated with higher odds of flourishing included attended university (OR:1.44 [1.05-1.99]), being in a relationship (OR: 1.64 [1.22-2.21]), being employed (OR: 1.97 [1.27-3.11]), high sleep quality (OR: 3.45 [2.53-4.73]), meeting leisure screen time guidelines (OR: 2.12 [1.59-2.85]), and relatively high levels of coping ability (OR: 3.11 [2.58-3.80]). Variables associated with lower odds of flourishing included living alone (OR:0.58 [0.38-0.86]), relatively low household income (OR: 0.37 [0.20-0.64]), and high depressive (OR: 0.05 [0.01-0.15]) and anxiety (0.17 [0.09-0.29]) symptoms.

Conclusions: Sociodemographic (education, relationship status, employment status, income), lifestyle (sleep, screen time) and psychological (coping ability, depressive and anxiety symptoms) are correlates of flourishing mental health in this population-based sample of young adults. Results provide a foundation for future research to inform the development of effective programs targeting specific subgroups to promote positive mental health in young adults.

Keywords: Positive mental health, flourishing, young adults, correlates, cross-sectional

Introduction

Early adulthood is a transitional period that begins in late adolescence and lasts well into the third decade of life (Arnett, 2000; Medley, 1980; Weiland, 1993). During this period, young adults navigate multiple new life roles and responsibilities (e.g., changes in relationships, education, and residential status) that can challenge their mental health and increase the risk of developing mental disorders (Dreger et al., 2014; Keyes, 2002; Winzer et al., 2014). Research on young adults' mental health to date has largely focused on common mental disorders including depression and anxiety (e.g., (Dreger et al., 2014; Gilmour, 2014; Guo et al., 2018; Semkowska et al., 2019; Sylvia et al., 2017; Tunvirachaisakul et al., 2018; Van Dorn et al., 2012). However, low levels of positive mental health are associated with limitations in daily life (e.g., missed days of work, physical conditions) (Keyes, 2005) even in the absence of symptoms of mental disorders. From a public health perspective, poor mental health is associated with a notable economic burden in developed countries (Santini et al., 2021). To acquire more comprehensive understanding of overall mental health and its determinants in young adults, as well as to develop effective mental health promotion programs and maximize resources targeting young adults, it is crucial to consider positive mental health alongside mental illness.

In 2002, Keyes introduced the concept of “complete mental health” to distinguish positive mental health from the traditional focus on mental illness (Keyes, 2002). In Keyes' two-continua model, positive mental health and mental disorders are independent but related concepts (Keyes, 2002). Positive mental health includes emotional well-being (i.e., the experience of positive emotions such as joy), psychological well-being (i.e., positive functioning in various aspects of life, including but not limited to self-acceptance and personal growth), and social well-being (i.e., positive social functioning such as social acceptance and integration) (Doré & Caron, 2017). Keyes's model and related measurement scale, the Mental Health Continuum-Short Form, enable the classification of individuals into three categories of positive mental health: flourishing, moderate, and languishing (Keyes, 2002). The term *flourishing* refers to a high level of positive mental health, and is a combination of feeling good (i.e., hedonic well-being) and functioning well (i.e., eudaimonic well-being) (Keyes, 2002, 2007). Languishing refers to low levels of both positive emotions and positive functioning, and moderate is intermediate between flourishing and languishing (Keyes, 2002).

According to the Canadian Community Health Survey – Mental Health (CCHS-MH 2012), 71.1% of Canadians aged 25 to 44 years had flourishing mental health in 2012, a lower proportion than among adults aged 45 to 64, 65 to 74, and 75 or over (i.e., 74.4%, 79.6%, and 78.3%, respectively). Interestingly, these prevalences are higher than those typically reported in many other countries (e.g., (Karaš et al., 2014; Keyes, 2005; Yin et al., 2012)). Higher levels of flourishing are associated with fewer missed work days (Keyes, 2002), better academic performance among students (Keyes et al., 2012), better physical health (Gilmour, 2014), effective learning, high productivity, strong creative skills (de la Fuente et al., 2020) and prosocial behaviour (Dreger et al., 2014; Keyes et al., 2002; Schotanus-Dijkstra et al., 2016)

A wide range of factors are associated with mental disorders in young adults including sex, income, education (Asselmann & Beesdo-Baum, 2015), physical health, physical activity, sleep, screen time, body image, substance use, social support and violence/discrimination (Gustavson et al., 2018 ; Schaakxs et al., 2017; Dreger et al., 2014; Gilmour, 2014; Semkovska et al., 2019; Sylvia et al., 2017; Tunvirachaisakul et al., 2018; Van Dorn et al., 2012). In contrast, few studies identify factors related to positive mental health, especially among young adults. understanding the distribution of positive mental health over a wide range of traits and behaviours will allow for better identification of subpopulations at risk of low levels of positive mental health, which could lead to an increased risk of developing mental disorders (Doré et al., 2020). The present study aims to address this gap by identifying sociodemographic, lifestyle, and psychological correlates of flourishing mental health in a population-based sample of young adults.

Methods

Data was drawn from Nicotine Dependence in Teens (NDIT), a longitudinal study that included 1294 participants ages 12-13 years at NDIT inception in 1999-2000, in a purposive sample of ten high schools in Montreal, Canada. The sample included a mix of French and English-language schools, urban, suburban and rural schools, and schools located in neighborhoods of low, moderate and high socioeconomic status. Self-report questionnaires were completed every three months by students in the ten study schools from grade 7 to grade 11, for a total of 20 data collection cycles during high school. After high school, self-report questionnaires were completed in cycles 21 to

25 when participants were age 20.4, 24.0, 30.6, 33.6 and 35.2 years on average. At NDIT inception, participant characteristics were comparable to those of same-age youth participating in the 1999 provincially representative Québec Child and Adolescent Health and Social Survey (Paradis et al., 2003).

Cross-sectional data for the current analyses were drawn from cycle 23 (2017-20) of NDIT. Cycle 23 is the first to incorporate positive mental health data in NDIT, providing a valuable opportunity to explore the unique mental health challenges and opportunities experienced by young adults, a group that has generally been underrepresented in research. To compare characteristics of participants at inception with current participants, data on sociodemographic variables (i.e., age, sex, born in Canada, mother university-educated) were drawn from cycle 1 (i.e., at NDIT inception). The NDIT study was approved by the Ethics Research Committee of the Centre de Recherche du Centre Hospitalier de l'Université de Montréal. Participants (who had all attained legal age in cycle 23) provided informed consent.

Study Variables

Positive mental health was measured using the Mental Health Continuum - Short Form (MHC-SF), which comprises 14 items selected to represent emotional well-being (3 items), psychological well-being (6 items) and social well-being (5 items). Response for all items were assessed in a 6-point Likert-type scale ranging from never (0) to always (5) in the past month. In previous work, the internal consistency and the composite reliability of the subscales of the MHC-SF were relatively high according to Cronbach's alpha coefficient (i.e., > 0.70 for all three subscales) and Jöreskog's rho (0.79 to 0.90) (Doré et al., 2017). The Cronbach's alpha of the MHC-SF subscales in NDIT cycle 23 ranged from 0.84 to 0.91. Based on Keyes 3-level categorization of positive mental health (flourishing, moderate, languishing) using the MHC-SF scale (Keyes, 2002), flourishing mental health (yes, no) was defined as experiencing at least one of the three emotional well-being items and at least six of the 11 psychosocial functioning items (i.e., social and psychological well-being) always or most of the time during the past month. All other participants were categorized as not flourishing. Evidence that the categorization is valid is available (Keyes, 2002, 2005, 2007).

Factors investigated as potential correlates of flourishing mental health were selected based on a literature review and availability of data on the variable in NDIT. All factors were measured in cycle 23, except sex which was measured in cycles 1-11. These included ten sociodemographic factors, eight lifestyle factors, and three psychological factors.

Sociodemographic factors included age, sex (male, female), lives alone (yes, no), lives with children (yes, no), lives with parent(s) (yes, no), in a relationship (yes, no), attended university (yes, no), currently a student (yes, no), currently employed (yes, no) and annual household income (< \$29,999, \$30,000 - \$100,000, ≥ \$100,000 CAN\$, don't know). All sociodemographic variables except age, were used as categorical variables in the analyses.

Lifestyle factors included past-year daily cigarette smoking status (yes, no), past-year weekly/daily binge drinking (yes, no), and past-year daily marijuana, cannabis, and hashish use, (yes, no). Movement behaviours included team sport participation (yes, no), meeting moderate-to-vigorous physical activity (MVPA) guidelines (yes, no), sleep quality (low, high), work/school screentime (mean hours/week), and meets leisure screen time guidelines (yes, no). Meeting MVPA guidelines (at least 150 minutes per week (CSEP, 2012)) was assessed using the short version of the International Physical Activity Questionnaire (IPAQ-SF). Sleep quality over the past month was reported from poor to excellent. Hours of screen time per day was measured using questions adapted from the Ontario Student Drug Use and Health Survey (OSDUHS) (Boak et al., 2013). All lifestyle variables except work/school screen time were used as categorical variables in analyses.

Finally, psychological factors included general coping ability (poor to excellent), depressive symptoms (none/mild, moderate/severe) and general anxiety symptoms (none/mild, moderate/severe). The general coping ability variable (CCHS, 2015) was used as a continuous variable. Depressive symptoms were measured using the Major Depressive Inventory (MDI) (Bech et al., 2001) which comprises 12 items inquiring about the frequency of depressive symptoms in the past two weeks with responses ranging from at no time (0) to all the time (5). We used a cut-off score of 25 to differentiate participants with at least moderate depressive symptoms from participants with no depressive symptoms or mild symptoms (Bech et al., 2001). In NDIT,

the internal consistency measured using Cronbach's alpha was $\alpha = 0.89$. Anxiety symptoms were assessed using the General Anxiety Disorder (GAD-7) questionnaire which includes seven items measuring the frequency of anxiety symptoms in the past two weeks, with response options ranging from not at all (0) to nearly every day (3). A cut-off score of 10 was used to identify participants with at least moderate anxiety symptoms (yes, no) (Spitzer et al., 2006). In the NDIT sample, the internal consistency measured using Cronbach's alpha was $\alpha = 0.91$. Depressive and anxiety symptoms were used as categorical variables in the analyses.

Table S1 in the Supplementary Material describes questionnaire item(s) for each study variable, response options, recoding for analysis, data on psychometric properties and validity if available, and references.

Data Analysis

Descriptive analyses included checking for missing data, identifying outliers, and assessing distributions. Means (SD) and medians (IQR) were computed for continuous variables, and proportions were computed for categorical variables. To avoid issues of multiple testing, we conducted a set of three logistic regression models for each potential correlate of flourishing mental health (yes, no). Each set comprised an independent study which addressed a specific hypothesis (one per potential correlate) within which only three statistical tests were performed (i.e., an unadjusted model (model 1), a minimally adjusted model with a common set of covariates (age, sex) across all potential correlates (model 2), and a more fully adjusted model (model 3) which, based on VanderWeele's Disjunctive Cause Criterion (VanderWeel, 2019), added covariates specific to the potential correlate of interest in addition to age and sex.

All statistical analyses were conducted using R software version 4.1.3.

Results

Of 1294 NDIT participants who completed cycle 1 (at NDIT inception), 799 (56.1% female, mean (SD) age = 30.6 (1.0) years) completed the cycle 23 questionnaire and 792 (61.2% of 1294) were retained for analyses. Among those not retained (n=502), 495 did not complete cycle 23 and 7

participated in cycle 23 but did not provide data on positive mental health. Participants retained were younger on average than those not retained. Relatively more participants retained were female and had university-educated mothers (Table 1). In cycle 23, missing data did not exceed 8% for any variable.

Of 792 participants retained for analysis, 39.4% reported flourishing mental health including 39.9% of females and 38.8% of males. Table 2 shows the proportion of participants that reported flourishing mental health according to each potential correlate. The highest proportions of flourishing were observed among participants with very good (55.4%) or excellent (70.3%) coping ability, high sleep quality (51.1%), meeting leisure screen time guidelines (50.2%), an annual household income \geq \$100,000 (48.0%), and currently being a student (47.1%). The lowest proportions of flourishing were observed among participants with poor coping ability (0.0%), moderate/severe depressive symptoms (3.4%), moderate/severe anxiety symptoms (12.1%), poor/fair sleep quality (23.5%), and participants with an annual household income $<$ \$29,999 (24.7%).

Table 3 shows the results of the unadjusted (model 1) and minimally and fully adjusted logistic regression models (model 2 and 3). Ten of the 21 potential correlates investigated were associated with flourishing mental health in fully adjusted multivariable models (model 3). For sociodemographic variables, we observed that being in a relationship (OR [95%CI]: 1.64 [1.22-2.21]), attended university (OR [95%CI]:1.44 [1.05-1.99]), and being currently employed (OR [95%CI]: 1.97 [1.27-3.11]) were associated with higher odds of flourishing mental health. Living alone (OR [95%CI]:0.58 [0.38-0.86]) and having lower annual household income (OR [95%CI]: 0.37 [0.20-0.64]) were associated with lower odds of flourishing mental health. For lifestyle variables, high sleep quality (OR [95%CI]: 3.45 [2.53-4.73]) and meeting leisure screentime guidelines (OR [95%CI]: 2.12 [1.59-2.85]) were associated with higher odds of flourishing mental health in fully adjust models. For psychological variables, higher levels of coping ability (OR [95%CI]: 3.11 [2.58-3.80]) were associated with higher odds of flourishing mental health whereas reporting depressive (OR [95%CI]: 0.05 [0.01-0.15]) or anxiety symptoms (OR [95%CI]: 0.17 [0.09-0.29]) were associated with lower odds of flourishing mental health.

Discussion

In this study, we describe flourishing mental health according to a range of potential correlates in a population-based sample of young adults. The proportion of young adults with flourishing mental health (39.4%) was markedly lower than the 71% observed among Canadians ages 25-44 in the CCHS (Gilmour, 2014), but does align with proportions observed in other studies using the MHC-SF (e.g., (Karáš et al., 2014; Keyes et al., 2008; Salama-Younes, 2011; Yin et al., 2012)). Differences with CCHS 2012 data may relate to the younger age of NDIT participants. The following paragraphs discuss findings on the correlates of flourishing, including living alone, being in a relationship, education, employment, income, cigarette smoking, physical activity, sleep, screen time, depressive and anxiety symptoms.

Consistent with previous studies (Joutsenniemi et al., 2006; Tamminen et al., 2019), we detected an inverse association between living alone and positive mental health. Only 5% of NDIT participants who lived alone were in a relationship, possibly reflecting a personal preference to live alone. However, 72% of single adults ages 20-34 in Canada intend to eventually form a union and 67% would like to have children (Tang et al., 2019). Because the number of people living alone in Canada is increasing (StatCan, 2022), the issue of lower mental health in this subgroup is of high societal importance. Participants in our sample who were in a relationship had higher odds of positive mental health, which aligns with extant literature (Diener & Ryan, 2009; VanderWeele, 2017). In addition to the social interaction inherent in cohabiting, being in a strong relationship can be very fulfilling (Fowers & Owenz, 2010); it can contribute to a sense of security and happiness (Umberson & Karas Montez, 2010), and reduce feelings of isolation and loneliness (O'Neal & Wickrama, 2021). Healthy relationships buffer life stresses (Thomas et al., 2017) and often bring a sense of purpose and commitment by working towards shared goals (Uecker, 2012). Studies on communication patterns and overall quality of the relationship are needed to identify the underpinnings of the association between being in a relationship and positive mental health.

Consistent with previous studies (Dreger et al., 2014; Gilmour, 2014; Keyes & Simoes, 2012; Lluch-Canut et al., 2013; Van Lente et al., 2012), higher education was positively associated with flourishing mental health. Possible mechanistic underpinnings include availability of education-related resources (e.g., income, health insurance), cognitive skills, and social integration (Cutler

& Lleras-Muney, 2010). NDIIT participants with flourishing mental health were more likely to be employed, which also aligns with the literature (CIHI, 2011). Employment can provide a sense of purpose, a structured routine, skill development and social interaction (Modini et al., 2016), all of which contribute positively to mental health. Research on what constitutes an optimal job/workplace given an individual's context is needed to better understand the association between employment and positive mental health. Additionally, employment generates an income, which is associated with happiness (Kahneman & Deaton, 2010; Li & Ning, 2022). Our study supports reports of a positive linear association between income and positive mental health (Dreger et al., 2014; Gilmour, 2014; Van Lente et al., 2012). People with flourishing mental health likely generate higher levels of income by being more productive (Keyes, 2007), and higher levels of income lead people to access more resources, which may lead to flourishing. Interestingly, not knowing the annual household income was associated with lower odds of positive mental health in this study.

Contrary to past work reporting an inverse association between cigarette smoking and positive mental health (Keyes & Simoes, 2012; Lappan et al., 2020; Sofija et al., 2020), no association was detected in this study after adjusting for age, sex, income, living with children, and education. While it is possible that our model was over-adjusted resulting in null findings, our finding may underscore complexity in the relationship between smoking and mental health. While smoking is often associated with mental health problems, the dynamics may vary across different populations, and the effects could be influenced by broader behavioral or psychosocial factors that were not measured in this study (e.g., social support, stress). Future longitudinal research should examine how cigarette smoking relates to mental health in diverse contexts.

The present study adds to growing evidence on the association between positive mental health and movement behaviours (i.e., physical activity, sleep and sedentary behaviour). Our finding of no association between meeting MVPA guidelines and flourishing contradicts previous reports (e.g., (Doré et al., 2018; O'Rourke et al., 2023; Tamminen et al., 2020)). This could be because we used a dichotomous variable to represent this exposure, which reduces variability in the measure substantially. About half of NDIIT participants met MVPA guidelines, with some doing the minimum time required and others attaining more than three times the recommended time. It is

possible that an association cannot be detected because of reduced variability (i.e., meeting MVPA guidelines might not be the optimal threshold to explore this association). Similar to previous work (Wickham & Amarasekara, 2020), our results show a strong positive association between sleep quality and positive mental health, a relationship that might be bidirectional (Brailovskaia et al., 2024). As bedtime procrastination is higher at younger ages (Herzog-Krzywoszanska & Krzywoszanski, 2019), future studies should evaluate interventions prioritizing sleep quality to maximize mental health and well-being in young adults. Meeting Canada's 24-Hour Movement Guidelines for Adults (18 – 64 years old) guidelines on screen time is associated with higher odds of flourishing mental health. Regardless of potential benefits, excess screentime can limit more healthful activities such as physical activity and social interactions (George et al., 2023). Guidelines reflect growing awareness of the integrated nature of movement behaviours that together influence mental health outcomes (Weatherson et al., 2020). Investigating the link between well-being and risky behaviours such as screen use increases understanding of factors that lead to, and ways to prevent, engagement in such behaviours.

Consistent with studies in other populations (Almweisheer et al., 2023; Doré et al., 2020; Gilmour, 2014; Keyes et al., 2010; Schotanus-Dijkstra et al., 2016; Vaingankar et al., 2013), depressive and anxiety symptoms were associated with lower positive mental health. Although distinct constructs, depression and positive mental health are inversely correlated in adults (Grant et al., 2013). In a 10-year longitudinal study, improvements in mental well-being predict declines in mental distress, while declines in mental well-being predict improved mental distress (Keyes et al., 2010). Our results align with studies supporting that positive mental health and anxiety are related but distinct constructs (e.g., (Doré et al., 2020; Keyes, 2002). Notably, participants were asked about current symptoms, rather than diagnoses. To inform the development of effective interventions, research is needed to identify what predicts, enhances and maintains flourishing in young adults with and without symptoms of mental disorders.

Limitations

Limitations of this study include its cross-sectional design which precludes causal inference. Bidirectionality of the associations investigated could not be ascertained. Data on numerous factors possibly associated with positive mental health (e.g., discrimination, spirituality, violence,

parenting style) were not collected in NDIT. Measurement error especially in self-report data, is possible. For example, socially undesirable behaviors such as binge drinking and cigarette smoking may be underreported. The relatively small sample size may have limited the ability to detect some associations. Use of a purposive sample at inception and loss to follow-up over time may have limited generalizability of the findings. Loss to follow-up is also a possible source of selection bias.

Implications

This study identifies correlates of flourishing mental health that are amenable to public health interventions among young adults in Canada. Future longitudinal studies can help determine whether these are causal. In the interim, correlates of flourishing mental health identified herein may indicate subgroups which could benefit from targeted intervention to promote positive mental health.

Conclusion

Findings on the correlates of flourishing mental health in this study contribute to growing understanding of the association between positive mental health and sociodemographic, lifestyle, and psychological indicators among young adults. If the findings are replicated, program planners may need to consider the correlates identified herein in conceptualizing public health strategies to improve positive mental health in young adults.

References

- Almweisheer, S., Bernstein, C. N., Graff, L. A., Patten, S. B., Bolton, J., Fisk, J. D., Hitchon, C. A., Marriott, J. J., & Marrie, R. A. (2023). Well-being and flourishing mental health in adults with inflammatory bowel disease, multiple sclerosis and rheumatoid arthritis in Manitoba, Canada: a cross-sectional study. *BMJ open*, *13*(6), e073782.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American psychologist*, *55*(5), 469.
- Asselmann, E., & Beesdo-Baum, K. (2015). Predictors of the course of anxiety disorders in adolescents and young adults. *Current Psychiatry Reports*, *17*, 1-8.
- Bech, P., Rasmussen, N.-A., Olsen, L. R., Noerholm, V., & Abildgaard, W. (2001). The sensitivity and specificity of the Major Depression Inventory, using the Present State Examination as the index of diagnostic validity. *Journal of affective disorders*, *66*(2-3), 159-164.
- Benowitz, N. L. (2008). Neurobiology of nicotine addiction: implications for smoking cessation treatment. *The American journal of medicine*, *121*(4), S3-S10.
- Brailovskaia, J., Teismann, T., & Margraf, J. (2024). Positive mental health accounts for the relationship between insomnia symptoms and suicide-related outcomes. *Journal of psychiatric research*.
- CIHI. (2011). *Recognizing and Exploring Positive Mental Health-Policy Dialogue: Synthesis and Analysis*. Government of Canada Publications: Canadian Institute for Health Information
- de la Fuente, R., Parra, A., Sanchez-Queija, I., & Lizaso, I. (2020). Flourishing during emerging adulthood from a gender perspective. *Journal of happiness studies*, *21*(8), 2889-2908.
- Diener, E., & Ryan, K. (2009). Subjective well-being: A general overview. *South African journal of psychology*, *39*(4), 391-406.
- Doré, I., & Caron, J. (2017). Santé mentale: concepts, mesures et déterminants. *Santé mentale au Québec*, *42*(1), 125-145.
- Doré, I., O'Loughlin, J. L., Sabiston, C. M., & Fournier, L. (2017). Psychometric evaluation of the mental health continuum—short form in French Canadian young adults. *The Canadian Journal of Psychiatry*, *62*(4), 286-294.
- Doré, I., O'Loughlin, J., Sylvestre, M.-P., Sabiston, C. M., Beauchamp, G., Martineau, M., & Fournier, L. (2020). Not flourishing mental health is associated with higher risks of anxiety and depressive symptoms in college students. *Canadian journal of community mental health*, *39*(1), 33-48.
- Dreger, S., Buck, C., & Bolte, G. (2014). Material, psychosocial and sociodemographic determinants are associated with positive mental health in Europe: a cross-sectional study. *BMJ open*, *4*(5), e005095.
- Fowers, B. J., & Owenz, M. B. (2010). A eudaimonic theory of marital quality. *Journal of Family Theory & Review*, *2*(4), 334-352.
- George, A. S., George, A. H., Baskar, T., & Shahul, A. (2023). Screens Steal Time: How Excessive Screen Use Impacts the Lives of Young People. *Partners Universal Innovative Research Publication*, *1*(2), 157-177.
- Gilmour, H. (2014). *Positive mental health and mental illness*. Statistics Canada Ottawa, ON.
- Grant, F., Guille, C., & Sen, S. (2013). Well-being and the risk of depression under stress. *PLoS one*, *8*(7), e67395.
- Guo, C., Tomson, G., Keller, C., & Söderqvist, F. (2018). Prevalence and correlates of positive mental health in Chinese adolescents. *BMC Public Health*, *18*, 1-11.

- Gustavson, K., Knudsen, A. K., Nesvåg, R., Knudsen, G. P., Vollset, S. E., & Reichborn-Kjennerud, T. (2018). Prevalence and stability of mental disorders among young adults: findings from a longitudinal study. *BMC psychiatry*, *18*, 1-15.
- Herzog-Krzywoszanska, R., & Krzywoszanski, L. (2019). Bedtime procrastination, sleep-related behaviors, and demographic factors in an online survey on a polish sample. *Frontiers in neuroscience*, *13*, 476005.
- Horwitz, A. V., White, H. R., & Howell-White, S. (1996). Becoming married and mental health: A longitudinal study of a cohort of young adults. *Journal of Marriage and the Family*, *895-907*.
- Hu, S., Cai, D., Zhang, X. C., & Margraf, J. (2022). Relationship between social support and positive mental health: A three-wave longitudinal study on college students. *Current Psychology*, *41*(10), 6712-6721.
- Joutsenniemi, K., Martelin, T., Martikainen, P., Pirkola, S., & Koskinen, S. (2006). Living arrangements and mental health in Finland. *Journal of Epidemiology & Community Health*, *60*(6), 468-475.
- Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Sciences*, *107*(38), 16489-16493.
- Keyes, C. L. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of health and social behavior*, 207-222.
- Keyes, C. L. (2007). Promoting and protecting mental health as flourishing: a complementary strategy for improving national mental health. *American psychologist*, *62*(2), 95.
- Keyes, C. L., & Grzywacz, J. G. (2005). Health as a complete state: The added value in work performance and healthcare costs. *Journal of Occupational and Environmental Medicine*, *47*(5), 523-532.
- Keyes, C. L., & Simoes, E. J. (2012). To flourish or not: Positive mental health and all-cause mortality. *American journal of public health*, *102*(11), 2164-2172.
- Keyes, C. L., Eisenberg, D., Perry, G. S., Dube, S. R., Kroenke, K., & Dhingra, S. S. (2012). The relationship of level of positive mental health with current mental disorders in predicting suicidal behavior and academic impairment in college students. *Journal of American college health*, *60*(2), 126-133.
- Keyes, C. L., Dhingra, S. S., & Simoes, E. J. (2010). Change in level of positive mental health as a predictor of future risk of mental illness. *American journal of public health*, *100*(12), 2366-2371.
- Lappan, S., Thorne, C. B., Long, D., & Hendricks, P. S. (2020). Longitudinal and reciprocal relationships between psychological well-being and smoking. *Nicotine and Tobacco Research*, *22*(1), 18-23.
- Li, C., & Ning, G. (2022). More income, less depression? Revisiting the nonlinear and heterogeneous relationship between income and mental health. *Frontiers in Psychology*, *13*, 1016286.
- Lluch-Canut, T., Puig-Llobet, M., Sánchez-Ortega, A., Roldán-Merino, J., Ferré-Grau, C., & Group, P. M. H. R. (2013). Assessing positive mental health in people with chronic physical health problems: correlations with socio-demographic variables and physical health status. *BMC Public Health*, *13*, 1-11.
- Matsuyama, Y., & Tabuchi, T. (2023). Does Tobacco Smoking Increase Social Isolation? A Mendelian Randomization Study. *American journal of epidemiology*, kwad229.

- Medley, M. L. (1980). Life satisfaction across four stages of adult life. *The International Journal of Aging and Human Development*, *11*(3), 193-209.
- Modini, M., Joyce, S., Mykletun, A., Christensen, H., Bryant, R. A., Mitchell, P. B., & Harvey, S. B. (2016). The mental health benefits of employment: Results of a systematic meta-review. *Australasian Psychiatry*, *24*(4), 331-336.
- Mudhovozi, P. (2012). Social and academic adjustment of first-year university students. *Journal of social sciences*, *33*(2), 251-259.
- O'Connor, M., Sanson, A. V., Toumbourou, J. W., Norrish, J., & Olsson, C. A. (2017). Does positive mental health in adolescence longitudinally predict healthy transitions in young adulthood? *Journal of happiness studies*, *18*, 177-198.
- O'Neal, C. W., & Wickrama, K. (2021). The contribution of stressful marital interactions to loneliness and health across mid-life and later adulthood. *Journal of family issues*, *42*(3), 553-570.
- Santini, Z. I., Nielsen, L., Hinrichsen, C., Nelausen, M. K., Meilstrup, C., Koyanagi, A., McDaid, D., Lyubomirsky, S., VanderWeele, T. J., & Koushede, V. (2021). Mental health economics: A prospective study on psychological flourishing and associations with healthcare costs and sickness benefit transfers in Denmark. *Mental Health & Prevention*, *24*, 200222.
- Schaakxs, R., Comijs, H. C., van der Mast, R. C., Schoevers, R. A., Beekman, A. T., & Penninx, B. W. (2017). Risk factors for depression: differential across age? *The American Journal of Geriatric Psychiatry*, *25*(9), 966-977.
- Schotanus-Dijkstra, M., Pieterse, M. E., Drossaert, C. H., Westerhof, G. J., De Graaf, R., Ten Have, M., Walburg, J., & Bohlmeijer, E. T. (2016). What factors are associated with flourishing? Results from a large representative national sample. *Journal of happiness studies*, *17*, 1351-1370.
- Semkovska, M., Quinlivan, L., O'Grady, T., Johnson, R., Collins, A., O'Connor, J., Knittle, H., Ahern, E., & Glod, T. (2019). Cognitive function following a major depressive episode: a systematic review and meta-analysis. *The Lancet Psychiatry*, *6*(10), 851-861.
- Sofija, E., Harris, N., Phung, D., Sav, A., & Sebar, B. (2020). Does flourishing reduce engagement in unhealthy and risky lifestyle behaviours in emerging adults? *International journal of environmental research and public health*, *17*(24), 9472.
- Sofija, E., Harris, N., Phung, D., Sav, A., & Sebar, B. (2020). Does flourishing reduce engagement in unhealthy and risky lifestyle behaviours in emerging adults? *International journal of environmental research and public health*, *17*(24), 9472.
- Stutzer, A., & Frey, B. S. (2006). Does marriage make people happy, or do happy people get married? *The Journal of Socio-Economics*, *35*(2), 326-347.
- Sylvia, L. G., Montana, R. E., Deckersbach, T., Thase, M. E., Tohen, M., Reilly-Harrington, N., McInnis, M. G., Kocsis, J. H., Bowden, C., & Calabrese, J. (2017). Poor quality of life and functioning in bipolar disorder. *International journal of bipolar disorders*, *5*, 1-8.
- Thomas, P. A., Liu, H., & Umberson, D. (2017). Family relationships and well-being. *Innovation in aging*, *1*(3), igx025.
- Tamminen, N., Reinikainen, J., Appelqvist-Schmidlechner, K., Borodulin, K., Mäki-Opas, T., & Solin, P. (2020). Associations of physical activity with positive mental health: A population-based study. *Mental Health and Physical Activity*, *18*, 100319.
- Tunvirachaisakul, C., Gould, R. L., Coulson, M. C., Ward, E. V., Reynolds, G., Gathercole, R. L., Grocott, H., Supasitthumrong, T., Tunvirachaisakul, A., & Kimona, K. (2018). Predictors

- of treatment outcome in depression in later life: a systematic review and meta-analysis. *Journal of affective disorders*, 227, 164-182.
- Twyman, L., Bonevski, B., Paul, C., & Bryant, J. (2014). Perceived barriers to smoking cessation in selected vulnerable groups: a systematic review of the qualitative and quantitative literature. *BMJ open*, 4(12), e006414.
- Uecker, J. E. (2012). Marriage and mental health among young adults. *Journal of health and social behavior*, 53(1), 67-83.
- Umberson, D., & Karas Montez, J. (2010). Social relationships and health: A flashpoint for health policy. *Journal of health and social behavior*, 51(1_suppl), S54-S66.
- Vaingankar, J. A., Subramaniam, M., Abidin, E., Picco, L., Phua, A., Chua, B. Y., & Chong, S. A. (2013). Socio-demographic correlates of positive mental health and differences by depression and anxiety in an Asian community sample. *Ann Acad Med Singap*, 42(10), 514-523.
- Van Dorn, R., Volavka, J., & Johnson, N. (2012). Mental disorder and violence: is there a relationship beyond substance use? *Social psychiatry and psychiatric epidemiology*, 47, 487-503.
- Van Lente, E., Barry, M. M., Molcho, M., Morgan, K., Watson, D., Harrington, J., & McGee, H. (2012). Measuring population mental health and social well-being. *International journal of public health*, 57, 421-430.
- VanderWeele, T. J. (2017). On the promotion of human flourishing. *Proceedings of the National Academy of Sciences*, 114(31), 8148-8156.
- Weatherson, K., Gierc, M., Patte, K., Qian, W., Leatherdale, S., & Faulkner, G. (2020). Complete mental health status and associations with physical activity, screen time, and sleep in youth. *Mental Health and Physical Activity*, 19, 100354.
- Weiland, S. (1993). Erik Erikson: Ages, stages, and stories. *Generations: Journal of the American Society on Aging*, 17(2), 17-22.
- Wickham, S.-R., & Amarasekara, N. A. (2020). The big three health behaviors and mental health and well-being among young adults: a cross-sectional investigation of sleep, exercise, and diet. *Frontiers in Psychology*, 11, 579205.
- Winzer, R., Lindblad, F., Sorjonen, K., & Lindberg, L. (2014). Positive versus negative mental health in emerging adulthood: a national cross-sectional survey. *BMC Public Health*, 14, 1-10.

Table 1 . Selected characteristics of participants retained and not retained in cycle 23, NDIT 1999-2020

	Retained (n = 792) ^a	Not retained (n = 502)
Female, %	56.1	45.0
Age at cycle 1, mean (SD)	12.7 (0.5)	12.9 (0.7)
Born in Canada, %	94.0	90.0
Mother university-educated, %	42.0	33.0

^aIncludes participants lost to follow-up since inception and participants with missing data in cycle 23.

^bAt inception in 1999 to 2000.

Table 2. Proportion of participants with flourishing positive mental health in each category of each potential correlate, NDI 1999-2020

Potential correlate	n	Flourishing % ^a
Sociodemographic		
Age, y [†]		
1 st tertile (mean age = 29.1)	267	40.8
2 nd tertile (mean age = 30.4)	262	38.9
3 rd tertile (mean age = 32.7)	263	38.4
Sex		
Female	444	39.9
Male	348	38.8
Lives alone		
No	660	41.4
Yes	131	29.0
Lives with children		
No	611	38.1
Yes	180	43.3
Lives with parent(s)		
No	696	40.2
Yes	95	32.6
In a relationship		
No	329	32.5
Yes	462	44.2
Attended university		
No	279	33.7
Yes	493	42.6
Currently a student		
No	683	37.9
Yes	104	47.1
Currently employed		
No	118	27.1
Yes	669	41.6
Annual household income, CAN\$		
\$100,000 or more	244	48.0
\$30,000 – \$99,999	419	38.2
Less than \$29,999	89	24.7
Don't know	36	30.6
Lifestyle		
Daily cigarette smoking		
No	637	40.5
Yes	114	29.8
Weekly/daily binge drinking		
No	718	40.0
Yes	71	33.8
Daily cannabis use		
No	718	40.1
Yes	73	32.9
Team sport participation		
No	601	38.6
Yes	184	42.4
Meets MVPA guidelines		
No	391	40.7
Yes	379	38.8
Sleep quality		
Poor/fair	336	23.5
Good/very good/excellent	456	51.1
Work/school screen time [†] , mean hrs/week		
1 st tertile[0 – 12]	259	35.5

2 nd tertile [16 – 37]	274	38.3
3 rd tertile [49.3 – 130]	240	41.3
Meets leisure screen time guidelines		
No	454	32.2
Yes	327	50.2
Psychological		
Coping ability		
Poor	33	0.0
Fair	130	7.7
Good	280	28.6
Very good	281	58.4
Excellent	68	85.3
Moderate/severe depressive symptoms		
No	713	42.1
Yes	59	3.4
Moderate/severe anxiety symptoms		
No	676	44.1
Yes	116	12.1

[†]Continuous variables were categorized for descriptive purposes

^aPercentages are based on available data, excluding missing values. Missing data for each correlate can be inferred from the differences between the total sample size (n = 792) and the number of participants in each category.

Table 3. Odd ratios and 95% confidence intervals for potential correlates of flourishing positive mental health in young adults (n=729-792), NDIT 1999-2020

Potential correlate	n	Model 1 OR _{crude} (95% CI)	Model 2 OR _{adj^a} (95% CI)	Model 3 OR _{adj^b} (95% CI)	
					Covariates included in Model 3
Sociodemographic					
Age	792	0.94 (0.82 – 1.08)	-	-	-
Sex	792	ref	-	-	-
Female		ref			
Male		0.96 (0.72 – 1.27)			
Lives alone	787	ref	ref	-	-
No		ref	ref		
Yes		0.58 (0.38 – 0.86)	0.58 (0.38 – 0.86)		
Lives with children	788	ref	ref	ref	Age, sex, income
No		ref	ref	ref	
Yes		1.27 (0.90 – 1.78)	1.31 (0.92 – 1.86)	1.34 (0.94 – 1.90)	
Lives with parent(s)	788	ref	ref	ref	Age, sex, income
No		ref	ref	ref	
Yes		0.71 (0.44 – 1.11)	0.70 (0.43 – 1.09)	0.71 (0.43 – 1.13)	
In a relationship	791	ref	ref	-	-
No		ref	ref		
Yes		1.64 (1.22 – 2.21)	1.64 (1.23 – 2.21)		
Attended university	772	ref	ref	-	-
No		ref	ref		
Yes		1.46 (1.08 – 1.99)	1.44 (1.05 – 1.97)		
Currently a student	787	ref	ref	-	-
No		ref	ref		
Yes		1.46 (0.96 – 2.21)	1.44 (0.95 – 2.19)		
Currently employed	768	ref	ref	ref	Age, sex, attended university
No		ref	ref	ref	
Yes		1.93 (1.26 – 3.04)	1.99 (1.29 – 3.14)	1.97 (1.27 – 3.11)	
Annual household income, CAN\$	768	ref	ref	ref	Age, sex, attended university
≥ \$100,000		ref	ref	ref	
\$30,000 - \$99,999		0.69 (0.50-0.96)	0.68(0.50-0.94)	0.72 (0.51 – 1.00)	
< \$30,000		0.36 (0.20-0.61)	0.34 (0.20-0.59)	0.37 (0.20 – 0.64)	
Don't know		0.49 (0.22-1.01)	0.48 (0.22-1.00)	0.50 (0.23 – 1.04)	
Lifestyle					
Daily cigarette smoking	729	ref	ref	ref	Age, sex, income, lives with children, attended university
No		ref	ref	ref	
Yes		0.64 (0.41 – 0.98)	0.65 (0.42 – 1.01)	0.78 (0.49 – 1.23)	
Weekly/daily binge drinking	765	ref	ref	ref	Age, sex, income, lives with children, attended university
No		ref	ref	ref	
Yes		0.77 (0.45 – 1.27)	0.77 (0.45 – 1.28)	0.85 (0.49 – 1.46)	
Daily cannabis use	787	ref	ref	ref	Age, sex, income, lives with children
No		ref	ref	ref	
Yes		0.75 (0.44 – 1.24)	0.76 (0.45 – 1.26)	0.91 (0.53 – 1.53)	
Team sport participation	776	ref	ref	ref	Age, sex, currently a student, income
No		ref	ref	ref	
Yes		1.13 (0.80 – 1.58)	1.14 (0.80 – 1.62)	1.08 (0.75 – 1.55)	
Meets MVPA guidelines	761	ref	ref	ref	Age, sex, currently a student, income
No		ref	ref	ref	
Yes		0.93 (0.70 – 1.25)	0.92 (0.69 – 1.24)	0.91 (0.68 – 1.22)	
Sleep quality	792	ref	ref	-	-
Low		ref	ref		
High		3.40 (2.50 – 4.64)	3.45 (2.53 – 4.73)		
Weekly work/school screen time, hrs	773	1.00 (1.00 – 1.01)	1.00 (1.00 – 1.01)	-	-

Meets leisure screen time guidelines No Yes	781	ref 2.12 (1.59 – 2.85)	ref 2.13 (1.59 – 2.85)	-	-
Psychosocial Coping ability	792	4.28 (3.41 – 5.45)	4.78 (3.76 – 6.18)	-	-
Moderate/severe depressive symptoms No Yes	772	ref 0.05 (0.01 – 0.16)	ref 0.05 (0.01 – 0.15)	-	-
Moderate/severe anxiety symptoms No Yes	792	ref 0.17 (0.09 – 0.30)	ref 0.17 (0.09 – 0.29)	-	-

Sample size range from 729 to 792 because of missing data

Bold indicates that the confidence interval excludes the null value

^aAge and sex included in all models

^bIn addition to age and sex, models included other variables related to the potential correlate

Supplementary Material

Table S1. Description of questionnaire item(s), response options and recoding of response options for analysis for all study variables, Nicotine Dependence in Teens Study, Montreal, Canada, 1999-2020

Variable (reference)	Data drawn from cycle(s)	Item(s)	Response choices	Recoding for analysis	Psychometric properties
Sociodemographic indicators					
Age	23	Cycle 1-20: In what month is your birthday? On what day of the month is your birthday? In what year were you born? Cycle 23: What is today's date?	(day) (month) (year)	Used to compute age in years	---
Sex	1-11	Are you a boy or a girl?	Male; Female	----	---
Lives alone	23	Do you currently live alone?	No Yes	----	---
Lives with children	23	Do you live with your son(s), stepson(s)? Do you live with your daughter(s), stepdaughter(s)?	No Yes	----	---
Lives with parents	23	Do you live with your biological mother? Do you live with your biological father? Do you live with your stepmother? Do you live with your stepfather?	No Yes	----	---
Attended university	23	How far have you gone in school...	Attended high school, but did not graduate; Graduated high school; Attended CEGEP, community/technical college, but did not graduate; Graduated CEGEP, community/technical college; Attended university (or teacher's college), but did not graduate; Graduated university with a Bachelor's degree; Graduated university with a Master's degree; Graduated university with a PhD/ (professional degree); Other (specify)	Recoding school indicator to two education level categories: 1 - 4 = 1 5-8 = 2 As a final variable, decreasing levels of education were not permitted over time.	---

Currently a student	23	Are you currently enrolled as a full- or part-time student	No Yes, full-time Yes, part-time	Recoding student status into two categories: 1 = 1 2-3 = 2	---
In a relationship	23	What is your current marital status	Single; married; living as married (common-law); divorced; separated; other	Recoding into two categories: 1,4-5 = 1 2-3 = 2	---
Currently employed	23	Are you currently working at a job or business (paid or unpaid)?	No Yes	---	---
Annual household income	23	What is your best estimate of the total income, before taxes and deductions, of all household members from all sources in the past 12 months?	Less than \$20,000 \$20,000 - \$29,999 \$30,000 - \$39,999 \$40,000 - \$49,999 \$50,000 - \$59,999 \$60,000 - \$69,999 \$70,000 - \$79,999 \$80,000 - \$99,999 \$100,000 - \$119,999 \$120,000 - \$149,999 \$150,000 or more Don't know	Recoding income into four categories: 1-2 = 1 3-8 = 2 9-11 = 3 12 = 4	---
Lifestyle factors					
Past-year daily cigarette smoking status	23	Check the box that describes you best...	I have smoked cigarettes, but not at all in the past 12 months I smoked cigarettes once or a couple of times in the past 12 months I smoke cigarettes once or a couple of times each month I smoke cigarettes once or a couple of times each week I smoke cigarettes everyday	Recoded into dichotomous variable: 1-4 = 1 5 = 2	---
Past-year weekly/daily binge drinking	23	In the past 12 months, how often did you... Drink alcoholic beverages	Never; less than once a month; 1-3 times per month; 1-6 times per week; everyday	Recoded into dichotomous variable: 1-3 = 1 4-5 = 2	---
Past-year daily cannabis use	23	In the past 12 months, how often did you use marijuana, cannabis or hashish without tobacco? In the past 12 months, how often did you use marijuana, cannabis or hashish mixed with tobacco?	Never; less than once a month; 1-3 times per month; 1-6 times per week; everyday	Recoded into dichotomous variable 1-4 = 1 5 = 2	---
Team sport participation	23	In the past 12 months, how many organized sports teams did you	As is None = 0	Recoded into dichotomous variable:	---

		belong to (where you practice with teammates or play against other teams)?		>0 = 1 0 = 2	
Meets MVPA (moderate-to-vigorous physical activity) guidelines	23	<p>During the last 7 days, on how many days did you do vigorous physical activities (heavy lifting, digging, aerobics, fast bicycling) for at least 10 minutes at a time? On the days that you did vigorous physical activities, how many minutes did you usually spend per day?</p> <p>In the last 7 days, on how many days did you do moderate physical activities (carrying light loads, bicycling at a regular pace, doubles tennis) for at least 10 minutes? Do not include walking On the days that you did moderate physical activities, how many minutes did you usually spend per day?</p>	As is	<p>After IPAQ cleaning, see guidelines;</p> <p>Meets guidelines = 1 if total combined minutes of MPA and VPA \geq 150 minutes; 0 otherwise</p>	The IPAQ-SF has a good test re-test reliability ($r = 0.80$)
Sleep quality	23	In general, how would you rate the overall quality of your sleep at night?	Poor; fair; good; very good; excellent	Recoded into dichotomous variable: 1-2 = 1 3-5 = 2	---
Work/school screen time (mean hours/week)	23	<p>How many hours do you usually spend in front of a screen for work or school on weekdays</p> <p>How many hours do you usually spend in front of a screen for work or school on weekends</p>	As is 888 – less than 30 minutes	<p>888 was recoded as 15 minutes</p> <p>Recoded to combine weekdays and weekends in one variable</p>	---
Leisure screen time (mean hours/weekday)	23	<p>How many hours do you usually spend in front of a screen for leisure time on weekdays</p> <p>How many hours do you usually spend in front of a screen for leisure time on weekends</p>	As is 888 – less than 30 minutes	<p>Recoded to meet guidelines</p> <p>Meets guidelines = 1 if screen time < 3h per day; 2 otherwise</p>	---
Psychosocial factor					
Coping ability	23	In general, how would you rate... your ability to handle unexpected and difficult problems (a family or personal crisis)	Poor Fair Good Very good Excellent	Average of both answers	---

		In general, how would you rate... your ability to handle day-to-day demands in your life (work, family, responsibilities)			
Mental health indicators					
Depressive symptoms (MDI) ¹⁻²	23	In the past two weeks, how much of the time have you...? (i) felt low in spirits or sad, (ii) lost interest in, or could no longer enjoy your daily activities, (iii) felt lacking in energy and strength, (iv) felt less self-confident, (v) had a bad conscience or feelings of guilt, (vi) felt that life wasn't worth living, (vii) had difficulty concentrating (when reading the newspaper or watching TV), (viii) felt very restless, (ix) felt subdued or slowed down (x) had trouble sleeping at night or waking up too early (xi) suffered from reduced appetite (xii) suffered from increased appetite	At no time; some of the time; slightly less than half of the time; slightly more than half of the time; most of the time; all the time	Responses to each item were summed to create a continuous score (range: 0-50) For items (viii) and (ix), the highest score was retained for scoring For items (xi) and (xii), the highest score was retained for scoring	Excellent internal consistency (Cronbach's alpha ranged 0.90-0.94 across studies). Correlation with another depression scale (HAM-D17) (r=0.86) indicated good external validity.
General anxiety symptoms (GAD-7) ³⁻⁵	23	In the past 2 weeks, how often have you been bothered by ...? (i) Feeling nervous, anxious, or on edge, (ii) Not being able to stop or control worrying, (iii) Worrying too much about different things, (iv) Trouble relaxing, (v) Being so restless that it's hard to sit still, (vi) Becoming easily annoyed or irritable, (vii) Feeling afraid as if something awful might happen	Not at all; several days; over half of the days; nearly every day	Responses to each item (0-3) were summed to create a continuous score (range: 0-21)	Excellent internal consistency (Cronbach's alpha = 0.92). Good test-retest reliability (intraclass correlation = 0.83). Good criterion, construct, factorial and procedural validity. Correlations with 2 other anxiety scales indicates good convergent validity: Beck Anxiety Inventory (r=0.72) and the Symptom Checklist-90

					anxiety subscale (r=0.74).
Positive mental health (MHC-SF) ⁶	23	In the past month, how often did you feel... (i) happy, (ii) interested in life, (iii) satisfied, (iv) you had something important to contribute to society (v) you belonged to a community (like a social group, or your neighborhood), (vi) that our society is becoming a better place for people like you, (vii) that people are basically good, (viii) that the way our society works makes sense to you, (ix) that you liked most parts of your personality, (x) good at managing the responsibilities of your daily life, (xi) you had warm and trusting relationships with others, (xii) you had experiences that challenged you to grow and become a better person, (xiii) confident to think or express your own ideas and opinions, (xiv) your life has a sense of direction or meaning to it	Never, rarely, sometimes, often, most of the time, always	Responses to each item (0-5) were summed to create a continuous score (range: 0-70)	Cronbach's alpha = 0.89 Moderate test-retest reliability

References for Table S1

1. Bech P, Rasmussen NA, Olsen LR, Noerholm V, Abildgaard W. The sensitivity and specificity of the Major Depression Inventory, using the Present State Examination as the index of diagnostic validity. *J Affect Disord.* 2001 Oct;66(2-3):159-64. doi: 10.1016/s0165-0327(00)00309-8.
2. Bech P, Timmerby N, Martiny K, Lunde M, Soendergaard S. Psychometric evaluation of the Major Depression Inventory (MDI) as depression severity scale using the LEAD (Longitudinal Expert Assessment of All Data) as index of validity. *BMC Psychiatry.* 2015 Aug 5;15:190. doi: 10.1186/s12888-015-0529-3.
3. Olsen LR, Jensen DV, Noerholm V, Martiny K, Bech P. The internal and external validity of the Major Depression Inventory in measuring severity of depressive states. *Psychol Med.* 2003 Feb;33(2):351-6. doi: 10.1017/s0033291702006724. PMID: 12622314.
4. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med.* 2006 May 22;166(10):1092-7. doi: 10.1001/archinte.166.10.1092.
5. Spitzer RL, Kroenke K, Williams JB, Löwe B. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med.* 2006 May 22;166(10):1092-7. doi: 10.1001/archinte.166.10.1092.

6. Lamers SM, Westerhof GJ, Bohlmeijer ET, ten Klooster PM, Keyes CL. Evaluating the psychometric properties of the Mental Health Continuum-Short Form (MHC-SF). *J Clin Psychol.* 2011 Jan;67(1):99-110. doi: 10.1002/jclp.20741.

Chapter 6 Discussion

6.1 Overview of thesis

The objective of this thesis was to identify sociodemographic, lifestyle and psychological correlates of positive mental health in young adults. This objective was examined in a cross-sectional study design in young adults age 28 to 34. We used logistic regression to estimate associations between each potential correlate and positive mental health. This discussion summarizes our findings, compares our results with the existing literature providing insight into reasons underpinning similarities and differences, and finally, we reflect on strengths and limitations of the study.

6.2 Comparison of our results with the literature

Of 792 participants retained for analysis, 39.4% (i.e., 39.9% of females and 38.8% of males) reported flourishing mental health. Ten of 21 potential correlates investigated were associated with flourishing mental health in fully adjusted multivariable models. Variables associated with higher odds of flourishing mental health included attended university, being in a relationship, currently employed, good/very good/excellent sleep quality, and higher levels of coping ability. Variables associated with lower odds of flourishing mental health included living alone, low annual household income, not meeting leisure screen time guidelines, and reporting moderate/severe depressive and anxiety symptoms. In our study we found no association with flourishing mental health for age, sex, living with children, living with parents, student status, cigarette smoking, binge drinking, cannabis use, team sport participation, meeting MVPA guidelines and work/school screen time.

The proportion of young adults with flourishing mental health (39.4%) was markedly lower than the 71% observed among Canadians ages 25-44 in the CCHS (Gilmour, 2014), but does align with proportions observed in other studies using the MHC-SF (e.g., (Karaś et al., 2014; Keyes et al., 2008; Salama-Younes, 2011; Yin et al., 2012). Differences with CCHS 2012 data may relate to the fact that NDIT participants were recruited in a nonprobabilistic sample of high schools and have been followed up since 1999-2000 with some loss-to-follow-up over time.

6.2.1 Sociodemographic factors

In contrast to previous studies (Gilmour, 2014; Keyes, 2002), no association was detected between age and positive mental health in this study. Several studies report that older age is associated with a higher risk of poor mental well-being (Dreger et al., 2014; Winzer et al., 2014), whereas others report that younger age is associated with poorer mental well-being (Esteban et al., 2012; Van Lente et al., 2012; Westerhof & Keyes, 2010). A possible explanation for the null findings in NDIIT is the limited age range of participants (28 to 34 years), with 85% of participants aged between 29 and 32, such that detection of any differential in positive mental health by age was not possible.

Our results suggesting no sex differences in positive mental health support at least one previous report (Waterman et al., 2010). Among studies reporting sex differences, (Schotanus-Dijkstra et al., 2016) found that females are more likely to report flourishing mental health compared to males; while at least two studies suggest the opposite (Keyes, 2007; Keyes et al., 2002). Hypotheses to explain differences in mental health by sex in this age group include hormonal changes during menses or pregnancy, which can induce mood swings in women (de la Fuente et al., 2020). These, as well as problems getting pregnant may affect mental health. It is noteworthy that 64% of live births in Canada in 2023 were among women ages 25 to 34 (StatCan, 2023). One study suggested that self-esteem (an important component of mental health) in females increased at a faster rate than in males from age 25 onwards (Galambos et al., 2006), which can influence their pursuit of purpose and accomplishment. Testosterone in men is also linked to motivation and goal-oriented behaviour (Fang et al., 2020). This is a period characterized by self-exploration, identity formation, and relative independence (Arnett, 2005), which might mean that gender differences in mental health are less pronounced. During this stage, both men and women may experience similar pressures related to education, career, and personal growth, which could diminish the traditional gendered patterns in mental health.

Our results align with previous studies suggesting an inverse association between living alone and positive mental health. People living alone do not constitute a uniform group (Tamminen et al., 2019). For example, about 5% of those living alone were in a relationship, possibly reflecting a personal preference to live alone. However, national data shows that a significant proportion of young adults (i.e., 72% of single Canadians aged 20-34) intend to eventually form a union, and

67% would like to have children in the future (StatCan, 2022). As the number of Canadians living alone continues to rise (from 7.3% in 1981 to 12.5% in 2021 among those aged 30-34) (StatCan, 2022), the issue of lower mental health among young adults living alone is of high societal importance. Living alone is linked to poorer positive mental health in both men and women aged 18 and older (Dreger et al., 2014), whereas men who live alone are at higher odds of experiencing mental illness than women (Joutsenniemi et al., 2006). This may signal that the correlates of positive mental health differ from the correlates of mental illness. Further investigations on positive mental health in general, as well as among people living alone may be warranted (Tamminen et al., 2019).

Our results do not align with studies reporting an association between childlessness and better mental health (Dreger et al., 2014; Evenson & Simon, 2005). Although one study suggested that childlessness in early adulthood may be stressful if reproduction hopes are unmet, especially among women with a lower family income (McQuillan et al., 2003), childless young adults in general report greater well-being than parents (Nomaguchi & Milkie, 2003). In our sample, 22% lived with children, and of those, 87% were in a relationship. Further, only 29% of participants living with children were male and of those, only two were single. Given that parenthood is associated with higher distress levels in unmarried (cohabiting or single) individuals, particularly unmarried women (Evenson & Simon, 2005), our sample may have reflected a more positive perspective on parenting. However, the different categorization of marital status in our study versus Evenson & Simon's (2005) limits the direct comparability of our findings with theirs. Future studies should examine how parenting costs and benefits vary in type and degree as children grow, for different marital statuses in both genders.

Our results align with a previous study suggesting an inverse association between living with parents and positive mental health (Howard et al., 2023). Studies on positive mental health in young adults living with parents are scarce, making it difficult to compare our findings with other research. Among NDIT participants living with their parents, 15% are students, 77% are not in a relationship, and 21% are unemployed. This may explain why our results suggest an inverse relationship between living with parents and positive mental health, despite the logistical, emotional and financial support that living with parents might offer. Living at home can sometimes

be perceived as a delay in achieving independence or developmental milestones, such as securing a job or forming relationships (Copp et al., 2017), which could lead to frustration or lower self-esteem. Over the last 30 years in Canada, increasing numbers of young adults live with their parents (Statistics Canada, 2022), warranting more research in this domain.

Our results align with most studies in detecting a positive association between being in a relationship and positive mental health. Marriage is associated with higher levels of life satisfaction, happiness, better physical and mental health, and higher levels of meaning and purpose in life (VanderWeele, 2017). Being in a relationship can influence positive mental health through emotional support (Umberson & Karas Montez, 2010), social connection (O'Neal & Wickrama, 2021), reduced stress, health benefits (Thomas et al., 2017) and sense of purpose (Uecker, 2012). Future studies on positive mental health should compare marital contexts, such as duration of the relationship, quality of the relationship or living arrangements, and their association with flourishing mental health.

Similar to NDIT, previous studies report increases in flourishing mental health levels among adults as educational attainment increases (Dreger et al., 2014; Gilmour, 2014; Jiang et al., 2020; Keyes & Simoes, 2012; Lluch-Canut et al., 2013). Several mechanisms may underpin this association including education-related resources, cognitive skills, and social integration, which together explain more than 60% of the education gradient (Cutler & Lleras-Muney, 2010; Jiang et al., 2020).

Unlike previous studies, our results did not detect an association between student status and positive mental health. However, a non statistically significant positive association was observed. Among participants who identified as students, 84% were attending university. It is noteworthy that NDIT participants (age 31 on average) who declared being student, were more likely to be pursuing graduate than undergraduate degrees. Previous work suggests variability in mental health across student populations related to year of education (Albright et al., 2022; Løset et al., 2022; Tran et al., 2022), with undergraduates generally reporting poorer mental well-being than graduate students (Lipson et al., 2016; Wyatt & Oswald, 2013). Students may be particularly vulnerable to mental health challenges during the transition to university, facing issues such as distress,

loneliness, isolation, and alienation (O'Rourke et al., 2023; Scanlon et al., 2007). They may learn to flourish as they achieve academic mastery, experience personal growth and independence, and secure a social support system (Knoesen & Naudé, 2018).

Similar to previous studies (Dreger et al., 2014; Gilmour, 2014; Keyes & Simoes, 2012; Lluch-Canut et al., 2013; Van Lente et al., 2012), our study found that employment was positively associated with flourishing mental health. Employment provides more than financial security; it offers social status, daily structure, opportunities for social interaction, and a sense of purpose (Gedikli et al., 2023), all of which promote both hedonic and eudemonic well-being (Ryan & Deci, 2001). Meta-analyses show that employment is associated with higher levels of life and family satisfaction, as well as better mental and physical health (VanderWeele, 2017). In contrast, unemployment negatively affects subjective well-being across age and education in both richer and poorer developed countries (Gedikli et al., 2023). However, living in an economically depressed area where unemployment levels are generally high reduces the impact of unemployment on the well-being of unemployed individuals (Clark, 2010).

Concordant with previous work, income and flourishing mental health were positively associated in NDIT (Chisholm et al., 2016; Shields-Zeeman & Smit, 2022; Thomson et al., 2022). A bidirectional or looped causality has been suggested in previous studies, whereby higher income leads to better mental health which is associated with increased productivity and participation in the labour market (Chisholm et al., 2016; Keyes, 2007; Shields-Zeeman & Smit, 2022). However, a study of college students found no difference in psychosocial functioning (i.e., eudaimonic well-being) relative to family income (Waterman et al., 2010). Studies of the impact of income change on flourishing mental health as well as the longitudinal effects of living on extremely high or low income are needed.

6.2.2 Lifestyle factors

Contrary to past work reporting an inverse association between cigarette smoking and positive mental health (Keyes & Simoes, 2012; Lappan et al., 2020; Sofija et al., 2020), no association was detected in this study after adjusting for age, sex, income, living with children, and education. While it is possible that our model was over-adjusted resulting in null findings, our finding may

underscore complexity in the relationship between smoking and mental health. While smoking is often associated with mental health problems, the dynamics may vary across different populations, and the effects could be influenced by broader behavioral or psychosocial factors that were not measured in this study (e.g., social support, stress). Future longitudinal research should examine how cigarette smoking relates to mental health in diverse contexts.

Our results, which suggest no association between marijuana, cannabis, or hashish use and flourishing mental health, differ from previous studies that reported either a positive association (Allen et al., 2017) or a negative association (Rhew et al., 2021). However, our findings align with a study on university students that found no relationship between frequency of marijuana use and well-being (Allen & Holder, 2014). Age differences in study populations may explain these discrepancies. Earlier research often focused on younger adults, consistent with evidence that marijuana use has a detrimental effect on brain development (e.g., (Testai et al., 2022)). However, this effect does not manifest when marijuana usage starts after adolescence (Schneider & Koch, 2003). In 2018, during our data collection, Canada legalized cannabis use for adults, leading to increased availability, reduced costs, and diminished perceptions of risk, which likely contribute to a higher prevalence of use (Amlung & MacKillop, 2019; Manthey et al., 2023). As reasons for cannabis use are multifactorial (i.e., social, enhancement, coping, conformity, perception-alteration, mind-expansion) (Patrick et al., 2011), cannabis use may have become more socially normative, diluting any clear relationship between cannabis use and flourishing mental health. For example, medical use of cannabis may reflect lower wellbeing due to medical issues (Barnwell et al., 2006). Future research should explore how shifts in societal attitudes and usage patterns post-legalization impact the association between cannabis use and flourishing mental health.

The absence of an association between binge drinking and flourishing mental health observed in our results align with a study of first-year college students (Low, 2011) and a 3-year study of Dutch adults (Schotanus-Dijkstra et al., 2016). Inclusion of income and living with children in the modeling may have resulted in wider confidence intervals and null findings. Given that alcohol use during emerging adulthood is often normative, distinguishing individuals with enduring substance use problems may be challenging (Arnett, 2005). Further studies are needed to investigate the temporal relationships between binge drinking and positive mental health, as well

as the influence of external factors such as social support, coping strategies and cultural norms on this relationship.

Contrary to previous studies in which team sport participation in early adulthood was associated with better mental health (Andersen et al., 2019; Doré et al., 2018; Eather et al., 2023; Murray et al., 2021), our study found no association. The mental health benefits of team sports are often attributed to positive experiences that foster social acceptance and reduce body dissatisfaction (Andersen et al., 2019; Murray et al., 2021). Negative effects of team sports participation could perhaps be due to stress and anxiety caused by intense competition or time commitment. In particular, young men may feel greater pressure to succeed competitively (Ramaecker & Petrie, 2019), which could detract from the mental health benefits of team participation. The lack of association in our findings might also reflect other factors, such as the nature or context of the team sports played (e.g., competitive vs recreational, gender-specific) that were not captured in our analysis. If the mental health benefits of team sports are more pronounced for certain types of sports or specific subgroups (Boyes et al., 2017; Machado-Oliveira et al., 2023), further research would be needed to explore these aspects in greater detail.

Interestingly, our findings suggest no association between meeting MVPA guidelines and flourishing mental health, contrary to previous reports (e.g.,(Bélanger et al., 2019; Groves et al., 2024; O'Rourke et al., 2023)). We used a dichotomous variable to represent this exposure (i.e., meeting MVPA guidelines (yes, no)), which might not have been optimal. The association may vary depending on the context, sense of belonging, and the level of social interaction involved in the activity. Previous research suggests that socially engaging activities (e.g., group exercise) provide greater mental health benefits than solitary exercise (Murray et al., 2021; O'Rourke et al., 2023).

Our results align with previous studies that report a positive association between flourishing mental health and sleep quality (Clayborne et al., 2023; Shin & Kim, 2018). Sleep is defined as the biological state in which the body and mind relax to renew energy, enhance the ability to cope with life, and maintain mental and physical health (Stern, 2021). Poor sleep quality is a common issue - one-quarter of adults ages 18-79 years in Canada report problems falling or staying asleep

most or all the time (DeSanto, 2011). A study of young adults in South Korea found that better sleep quality is associated with greater life satisfaction (Shin & Kim, 2018). Similarly, a recent study of Canadians age ≥ 12 years found that good sleep quality was associated with higher odds of positive mental health and lower odds of mental illness and suicidal ideation across all sex and age groups (Clayborne et al., 2023). In contrast, poorer sleep quality is associated with life dissatisfaction, poorer self-rated mental health, and lower community connectedness among Canadians age ≥ 18 years (Dai et al., 2020).

Our study found no association between work/school screen time and positive mental health which contradicts a previous study that suggested a correlation between education/professional screentime and psychological distress during the COVID pandemic (Wiciak et al., 2022). Given the small number of publications focused on screen time among employees and students, research in this realm is under-developed. Notably, our data were collected prior to the onset of the COVID-19 pandemic when screen time was more structured, which may have resulted in a more defined and predictable relationship between screen time and mental health. In contrast, the shift to remote work and online learning during the pandemic blurred the boundaries between personal and professional life. This change in screen time dynamics likely altered its impact on mental health, potentially explaining the differing results observed in pandemic-era studies, such as Wiciak et al. (2022). A more recent study by Prince et al. (2024) reported divergent associations between occupational and educational screen time. Specifically, while occupational screentime was positively associated with mental health, educational screentime had a negative correlation (Prince et al., 2024). By combining these two contexts into a single screentime variable in our study, we may have inadvertently overlooked these nuanced differences, which could have contributed to the null findings in our analysis. Additionally, a recent study found positive associations between occupational screen time and positive mental health but negative associations for educational screen time (Prince et al., 2024). By combining these contexts into a single variable, we may have missed nuanced associations, contributing to our null findings. These factors highlight the complexity of the relationship between screentime and mental health, suggesting that future research with more nuanced methodologies will be critical to understanding these dynamics.

Our study aligns with previous studies that report a positive association between meeting adult leisure screen time guidelines (<3 h/day) and flourishing mental health. Studies on Canadian adolescents found that high leisure screen time is negatively associated with self-esteem, resilience, and flourishing (Brown & Kwan, 2021; Faulkner et al., 2020). Young people who attained youth leisure screen time recommendations of < 2h daily had higher flourishing mental health than those who did not (Bang et al., 2020; Weatherson et al., 2020). More research on screen use during leisure time among young adults is needed (de la Rosa et al., 2024), especially since time spent using screens during leisure has been increasing (Prince et al., 2020).

6.2.3 Psychological factors

Ability to cope with stress was associated with positive mental health in our study. Past work suggests that handling stress well reduces symptoms of anxiety (Nasir & Lacroix, 2022), enhances resilience (Van der Hallen et al., 2020), improves relationships (Nasir & Lacroix, 2022), and leads to better physical health (Mucci et al., 2016). Studies are needed to explore possible pathways underpinning the association between the ability to handle stress and positive mental health.

Our results on depressive and anxiety symptoms align with a study of Canadian adults which reported that lower depressive and anxiety symptoms were associated with flourishing mental health (Almweisheer et al., 2023). Flourishing was associated with reductions of 28% in the risk of mood disorder and 53% in the risk of anxiety disorders among adults in the Netherlands (Schotanus-Dijkstra et al., 2016). Although distinct and separate dimensions, positive mental health and mental illness are intertwined and related to each other in Keyes' two continua model (Keyes, 2005). Both rely on a collection of symptoms and signs to identify underlying states or conditions (Keyes, 2007); external and subjective situations can cause individuals to move up and down the mental health continuum.

6.3 Strengths and Limitations

A key strength of this study is the large and representative sample, which enhances generalizability and ensures statistical power and precision. Another strength is its focus on an innovative outcome (i.e., positive mental health) which goes beyond traditional measures of mental illness to explore well-being. Additionally, the study targets young adults, an understudied subgroup in mental

health research, making it particularly valuable for understanding the unique challenges and opportunities for mental well-being during this life stage. Importantly, the cross-sectional design is appropriate for the study's descriptive objective aiming at identifying correlates of flourishing mental health. Moreover, our measure of positive mental health has been widely used and there is evidence of its validity, internal consistency and reliability (Doré et al., 2017; Keyes, 2002, 2007). Lastly, the study includes a comprehensive range of potential correlates of positive mental health, addressing multiple aspects of young adults' lives, from sociodemographic factors to lifestyle and psychological elements, providing a holistic view of the factors that contribute to mental well-being.

However, one potential limitation is residual confounding due to unmeasured confounding variables. We adjusted for a limited set of sociodemographic variables (e.g., age, sex, income, education, student status, living with children) that may affect both the potential correlate and positive mental health. While these adjustments likely helped reduce confounding, the potential for residual confounding remains. While self-report questionnaires are a cost-effective and relatively easy way to collect data, they are also susceptible to measurement error, which may have led to misclassification bias in the observed associations. A common limitation of self-reports is recall bias, where participants may distort their responses, particularly on sensitive topics (e.g., cannabis use, binge drinking), in order to align with social norms. By underreporting (or overreporting) socially undesirable (or desirable) attitudes and behaviours, results on the association may be biased. Employment status may also have been misclassified if people were technically employed but not actively working (e.g., on leave). While this could weaken the observed associations, we believe that any potential misclassification is unlikely to introduce differential bias across the groups compared, and thus is unlikely to significantly distort the associations. Household income was measured without accounting for how many people rely on that income, which could impact the interpretation of financial resources. Students from different fields, institutions, or education levels (undergraduate vs graduate) may have different experiences that are not captured in a single variable, potentially limiting the generalizability of certain findings. Other limitations include the inability to distinguish recreational from medicinal use of cannabis and to distinguish modalities of screen time use (e.g., multitasking, passive vs. active engagement). Selection bias may have occurred if the exposure and the outcome were linked to

loss to follow-up. Although participants retained had higher proportions of females and university-educated mothers, the lack of available data on positive mental health in previous cycles makes it difficult to definitively ascertain whether there is selection bias. Generalizability of our results may be limited because participants were recruited in schools selected using purposive sampling. However, at least at study inception, the characteristics of NDIT participants were comparable to those of same-age participants in a large provincially representative survey (Paradis et al., 2003). Even so, because the NDIT sample was largely white and most participants were born in Canada, the findings may not apply to other races or to immigrants.

6.4 Implications for research

Our findings identify sociodemographic, lifestyle, and psychological determinants of positive mental health that are amenable to intervention, offering valuable insights into the factors that contribute to well-being in young adults. In addition to adding to the body of knowledge on the correlates of positive mental health, our findings may increase understanding of the distribution of positive mental health over a wide range of traits and behaviours, among young adults thus allowing identification of subgroups that may benefit from mental health promotion intervention. This knowledge provides a foundation for tailoring mental health promotion efforts.

In terms of research, our study paves the way for future studies that can explore the sociodemographic, lifestyle, and psychological determinants of flourishing mental health in greater detail using longitudinal study design.

6.5 Implications for public health

From a public health perspective, the identification of modifiable factors that contribute to positive mental health among young adults holds significant potential for designing effective, evidence-based intervention programs. Our findings point to several key variables, such as employment status, sleep quality, coping ability, and relationship status, that are associated with flourishing mental health and could serve as valuable targets for mental health promotion efforts. By focusing on factors that enhance positive mental health, rather than solely addressing mental illness, public health initiatives can foster a proactive approach to mental health, preventing issues (such as loneliness and risky life behaviours) before they arise and promoting coping skills and overall

well-being. This shift in focus could ultimately facilitate smoother transitions into adulthood, improve quality of life, and reduce long-term mental health challenges for future generations.

Our findings also align with the Canadian Positive Mental Health Surveillance Indicator Framework, which advocates for a multi-level approach to mental health promotion. This framework emphasizes the importance of addressing individual, family, community, and societal determinants of mental health. The modifiable factors identified in our study primarily fall within the individual and family levels, making them particularly amenable to intervention.

At the individual level, interventions could focus on improving coping skills and sleep quality, as well as reducing excessive leisure screen time, factors that were found to be associated with flourishing mental health. These factors are important targets for mental health promotion efforts, and interventions could be integrated into school-based programs, workplace wellness initiatives, and community outreach efforts. At the family level, our findings highlight the importance of social connectedness in mental health. Public health initiatives could focus on promoting healthy relationships, including romantic relationships and family structures. This could involve family-based mental health programs or relationship counseling.

To ensure that efforts are targeted and impactful, interventions could be customized to meet the needs of different subgroups, specifically young adults who are unemployed, not in a relationship, living alone, not meeting leisure screen time guidelines, have poor sleep quality, lower levels of coping ability, low annual household income, and at least moderate depressive or anxiety symptoms. Targeted interventions could address the unique needs of these groups, such as providing job-seeking support and mental health resources for unemployed individuals or creating programs to combat loneliness and social isolation for those living alone. Additionally, young adults with poor sleep quality, low coping ability, or higher levels of depressive or anxiety symptoms may require more focused interventions aimed at improving mental health resilience and providing therapeutic support.

Expanding beyond traditional approaches, public health campaigns could leverage digital tools and platforms to reach young adults more effectively. Mobile health apps, virtual support groups, and online mental health resources can help bridge gaps in access.

Rather than solely focusing on the absence of mental illness, public health initiatives can take a holistic approach that enhances overall well-being. Supporting positive mental health not only improves the quality of life for young adults, but also boosts productivity and resilience, benefiting both individuals and communities. In the long term, promoting mental well-being can help reduce the burden of languishing mental health by encouraging healthy habits and psychological resilience from a young age, potentially lowering rates of depression, anxiety, and other mental health issues in the future. Furthermore, focusing on prevention and well-being could result in significant cost savings for society, reducing healthcare expenses, preventing lost workdays, and supporting overall economic stability.

6.6 Future directions

Our findings will need replication in a variety of settings before they can be translated into recommendations for intervention. Longitudinal studies could examine how sociodemographic, lifestyle, and psychological factors evolve over time and contribute to changes in mental health, which would be essential for understanding causal relationships and the long-term effects of early mental health promotion. For example, while being in a relationship can improve well-being, mentally healthier people could be more likely to enter into and remain in a relationship. Similarly, mentally healthier people could be more likely to find a job or remain employed, or have better sleep quality. In addition, hypotheses on the mechanisms that might underpin the associations detected could be investigated. For example a possible intercorrelation between income, living with children and having attended university with flourishing mental health needs to be further investigated. Some important gaps remain in our understanding of flourishing mental health, especially in relation to community and societal determinants. Although we identified several modifiable factors that contribute to positive mental health, future research should focus on exploring the broader context in which these factors operate. For example, more research is needed to examine the impact of social networks, community engagement, and socioeconomic inequalities on mental health at the community and societal levels. Finally, future research could explore the

processes that enable transitioning between flourishing and languishing, rather than just the experience of flourishing and languishing.

Chapter 7 Conclusion

This thesis investigated the association between possible correlates of flourishing mental health among young adults. Variables positively associated with flourishing included sociodemographic correlates (i.e., being in a relationship, attending university, being employed), lifestyle correlates (i.e., better sleep quality, meeting leisure screen time guidelines), and psychological features (i.e., having better coping abilities). Living alone, low household income, and moderate/severe depressive or anxiety symptoms were negatively associated with flourishing. Because our study is among the first to explore correlates of flourishing mental health in young adults, these results must be viewed as preliminary and in need of replication and extension. Well-powered longitudinal data are required to explore whether the correlates identified are causally linked to flourishing mental health and to identify mechanisms that underpin these relationships. Overall, these data lay the groundwork for future studies that will provide the evidence needed to develop effective programs to promote positive mental health among young adults.

Chapter 8 References

- Albright, G., Black, L. M., Graham, C., Stowe, A., Schwiebert, L., & Lanzi, R. (2022). 146. Trajectories of College Student Mental Health and Wellbeing During the COVID-19 Pandemic. *Journal of Adolescent Health, 70*(4), S77.
- Allen, J., Holder, M., & Walsh, Z. (2017). Cannabis use and well-being. *Handbook of cannabis and related pathologies*, 308-316.
- Allen, J., & Holder, M. D. (2014). Marijuana use and well-being in university students. *Journal of happiness studies, 15*, 301-321.
- Almweisheer, S., Bernstein, C. N., Graff, L. A., Patten, S. B., Bolton, J., Fisk, J. D., Hitchon, C. A., Marriott, J. J., & Marrie, R. A. (2023). Well-being and flourishing mental health in adults with inflammatory bowel disease, multiple sclerosis and rheumatoid arthritis in Manitoba, Canada: a cross-sectional study. *BMJ open, 13*(6), e073782.
- America's Health Rankings. (2021). *Mental and behavioral health data brief: Key findings by age*. A. s. H. Rankings.
- Amlung, M., & MacKillop, J. (2019). Availability of legalized cannabis reduces demand for illegal cannabis among Canadian cannabis users: Evidence from a behavioural economic substitution paradigm. *Canadian Journal of Public Health, 110*, 216-221.
- Andersen, M. H., Ottesen, L., & Thing, L. F. (2019). The social and psychological health outcomes of team sport participation in adults: An integrative review of research. *Scandinavian journal of public health, 47*(8), 832-850.
- Arango, C., Díaz-Caneja, C. M., McGorry, P. D., Rapoport, J., Sommer, I. E., Vorstman, J. A., McDaid, D., Marín, O., Serrano-Drozdownskyj, E., & Freedman, R. (2018). Preventive strategies for mental health. *The Lancet Psychiatry, 5*(7), 591-604.
- Argyle, M. (2013). *The psychology of happiness*. Routledge.
- Arnett, J. J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American psychologist, 55*(5), 469.
- Arnett, J. J. (2005). The developmental context of substance use in emerging adulthood. *Journal of drug issues, 35*(2), 235-254.
- Asselmann, E., & Beesdo-Baum, K. (2015). Predictors of the course of anxiety disorders in adolescents and young adults. *Current Psychiatry Reports, 17*, 1-8.
- Bang, F., Roberts, K. C., Chaput, J.-P., Goldfield, G. S., & Prince, S. A. (2020). Physical activity, screen time and sleep duration: Combined associations with psychosocial health among Canadian children and youth. *Health Rep, 31*(5), 9-16.
- Barnwell, S. S., Earleywine, M., & Wilcox, R. (2006). Cannabis, motivation, and life satisfaction in an internet sample. *Substance Abuse Treatment, Prevention, and Policy, 1*, 1-9.
- Bech, P., Rasmussen, N.-A., Olsen, L. R., Noerholm, V., & Abildgaard, W. (2001). The sensitivity and specificity of the Major Depression Inventory, using the Present State Examination as the index of diagnostic validity. *Journal of affective disorders, 66*(2-3), 159-164.
- Bélanger, M., Gallant, F., Doré, I., O'Loughlin, J. L., Sylvestre, M.-P., Abi Nader, P., Larouche, R., Gunnell, K., & Sabiston, C. M. (2019). Physical activity mediates the relationship between outdoor time and mental health. *Preventive medicine reports, 16*, 101006.
- Boak, A., Hamilton, H. A., Adlaf, E. M., & Mann, R. E. (2013). Drug use among Ontario students, 1977-2013.
- Boyes, R., O'Sullivan, D. E., Linden, B., McIsaac, M., & Pickett, W. (2017). Gender-specific associations between involvement in team sport culture and canadian adolescents' substance-use behavior. *SSM-population health, 3*, 663-673.

- Brailovskaia, J., Teismann, T., & Margraf, J. (2024). Positive mental health accounts for the relationship between insomnia symptoms and suicide-related outcomes. *Journal of psychiatric research*.
- Brown, D. M., & Kwan, M. Y. (2021). Movement behaviors and mental wellbeing: a cross-sectional isotemporal substitution analysis of Canadian adolescents. *Frontiers in Behavioral Neuroscience*, *15*, 736587.
- Burns, R. J., & Fardfini, K. (2021). Prevalence and Correlates of Positive Mental Health Among Canadian Adults With Type 1 or Type 2 Diabetes: Results From the Canadian Community Health Survey---Mental Health. *Canadian Journal of Diabetes*, *45*(7), 601-606.
- Capaldi, C. A., Liu, L., & Dopko, R. L. (2021). Positive mental health and perceived change in mental health among adults in Canada during the second wave of the COVID-19 pandemic. *Promotion de la Santé et Prévention des Maladies Chroniques au Canada*, *41*(11).
- CCHS. (2015). *Canadian Community Health Survey - Mental Health*. Statistics Canada Retrieved from https://www23.statcan.gc.ca/imdb/p3Instr.pl?Function=assembleInstr&Item_Id=119788#qb120272
- Chisholm, D., Sweeny, K., Sheehan, P., Rasmussen, B., Smit, F., Cuijpers, P., & Saxena, S. (2016). Scaling-up treatment of depression and anxiety: a global return on investment analysis. *The Lancet Psychiatry*, *3*(5), 415-424.
- CIHI. (2011). *Recognizing and Exploring Positive Mental Health-Policy Dialogue: Synthesis and Analysis*. Government of Canada Publications: Canadian Institute for Health Information
- Clark, A. E. (2010). Work, jobs, and well-being across the millennium. *International differences in well-being*, 436-468.
- Clayborne, Z. M., Dopko, R. L., Wang, C., Betancourt, M. T., Roberts, K. C., & Capaldi, C. A. (2023). Associations of sleep duration and sleep quality with indicators of mental health among youth and adults: findings from the 2015 Canadian Community Health Survey. *Health promotion and chronic disease prevention in Canada: research, policy and practice*, *43*(5), 243.
- CMHA. (2009). *Positive Mental Health and Well-Being*.
- CMHA. (2019). *Cohesive, Collaborative, Collective: Advancing Mental Health Promotion in Canada*. C. M. H. Association.
- Copp, J. E., Giordano, P. C., Longmore, M. A., & Manning, W. D. (2017). Living with parents and emerging adults' depressive symptoms. *Journal of family issues*, *38*(16), 2254-2276.
- Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., Pratt, M., Ekelund, U., Yngve, A., & Sallis, J. F. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine & science in sports & exercise*, *35*(8), 1381-1395.
- CSEP. (2012). Sedentary Behaviour Guidelines. *Canadian Society for Exercise Physiology*.
- Cutler, D. M., & Lleras-Muney, A. (2010). Understanding differences in health behaviors by education. *Journal of health economics*, *29*(1), 1-28.
- Dai, H., Mei, Z., An, A., Lu, Y., & Wu, J. (2020). Associations of sleep problems with health-risk behaviors and psychological well-being among Canadian adults. *Sleep Health*, *6*(5), 657-661.
- de la Fuente, R., Parra, A., Sanchez-Queija, I., & Lizaso, I. (2020). Flourishing during emerging adulthood from a gender perspective. *Journal of happiness studies*, *21*(8), 2889-2908.

- de la Rosa, P. A., Cowden, R. G., Bulbulia, J. A., Sibley, C. G., & VanderWeele, T. J. (2024). Effects of Screen-Based Leisure Time on 24 Subsequent Health and Wellbeing Outcomes: A Longitudinal Outcome-Wide Analysis. *International Journal of Behavioral Medicine*, 1-20.
- DeSanto, K. R. (2011). Public Health Agency of Canada. *Journal of Consumer Health On the Internet*, 15(2), 196-206.
- Diener, E., & Ryan, K. (2009). Subjective well-being: A general overview. *South African journal of psychology*, 39(4), 391-406.
- Doré, I., & Caron, J. (2017). Santé mentale: concepts, mesures et déterminants. *Santé mentale au Québec*, 42(1), 125-145.
- Doré, I., O'loughlin, J. L., Schnitzer, M. E., Datta, G. D., & Fournier, L. (2018). The longitudinal association between the context of physical activity and mental health in early adulthood. *Mental Health and Physical Activity*, 14, 121-130.
- Doré, I., O'Loughlin, J., Sylvestre, M.-P., Sabiston, C. M., Beauchamp, G., Martineau, M., & Fournier, L. (2020). Not flourishing mental health is associated with higher risks of anxiety and depressive symptoms in college students. *Canadian journal of community mental health*, 39(1), 33-48.
- Doré, I., O'Loughlin, J. L., Sabiston, C. M., & Fournier, L. (2017). Psychometric evaluation of the mental health continuum–short form in French Canadian young adults. *The Canadian Journal of Psychiatry*, 62(4), 286-294.
- Dreger, S., Buck, C., & Bolte, G. (2014). Material, psychosocial and sociodemographic determinants are associated with positive mental health in Europe: a cross-sectional study. *BMJ open*, 4(5), e005095.
- Dugas, E. N., O'Loughlin, E. K., Low, N. C., Wellman, R. J., & O'Loughlin, J. L. (2014). Sustained waterpipe use among young adults. *nicotine & tobacco research*, 16(6), 709-716.
- Eather, N., Wade, L., Pankowiak, A., & Eime, R. (2023). The impact of sports participation on mental health and social outcomes in adults: a systematic review and the 'Mental Health through Sport' conceptual model. *Systematic reviews*, 12(1), 102.
- Esteban, M. M., MI, P., & Gil de Miguel, A. (2012). Determinants of poor mental health in people aged 16 to 64 residing in a large city. *Anales del sistema sanitario de Navarra*,
- Evenson, R. J., & Simon, R. W. (2005). Clarifying the relationship between parenthood and depression. *Journal of health and social behavior*, 46(4), 341-358.
- Fang, H., Li, X., Wu, Y., & Peng, W. (2020). Single dose testosterone administration modulates the temporal dynamics of distractor processing. *Psychoneuroendocrinology*, 121, 104838.
- Fanslow, J. (2009). Improving the Health of Canadians: Exploring Positive Mental Health: A Commentary on the Canadian Institute for Health Information's Report.
- Faulkner, G., Weatherson, K., Patte, K., Qian, W., & Leatherdale, S. T. (2020). Are one-year changes in adherence to the 24-hour movement guidelines associated with flourishing among Canadian youth? *Preventive Medicine*, 139, 106179.
- Fowers, B. J., & Owenz, M. B. (2010). A eudaimonic theory of marital quality. *Journal of Family Theory & Review*, 2(4), 334-352.
- Fox, M. P., Murray, E. J., Lesko, C. R., & Sealy-Jefferson, S. (2022). On the need to revitalize descriptive epidemiology. *American journal of epidemiology*, 191(7), 1174-1179.
- Fusar-Poli, P. (2019). Integrated mental health services for the developmental period (0 to 25 years): a critical review of the evidence. *Frontiers in Psychiatry*, 10, 453564.

- Fusar-Poli, P., de Pablo, G. S., De Micheli, A., Nieman, D. H., Correll, C. U., Kessing, L. V., Pfennig, A., Bechdolf, A., Borgwardt, S., & Arango, C. (2020). What is good mental health? A scoping review. *European neuropsychopharmacology*, *31*, 33-46.
- Galambos, N. L., Barker, E. T., & Krahn, H. J. (2006). Depression, self-esteem, and anger in emerging adulthood: seven-year trajectories. *Developmental psychology*, *42*(2), 350.
- Gedikli, C., Miraglia, M., Connolly, S., Bryan, M., & Watson, D. (2023). The relationship between unemployment and wellbeing: an updated meta-analysis of longitudinal evidence. *European Journal of Work and Organizational Psychology*, *32*(1), 128-144.
- George, A. S., George, A. H., Baskar, T., & Shahul, A. (2023). Screens Steal Time: How Excessive Screen Use Impacts the Lives of Young People. *Partners Universal Innovative Research Publication*, *1*(2), 157-177.
- Gilmour, H. (2014). *Positive mental health and mental illness*. Statistics Canada Ottawa, ON.
- Grant, F., Guille, C., & Sen, S. (2013). Well-being and the risk of depression under stress. *PLoS one*, *8*(7), e67395.
- Groves, C. I., Huong, C., Porter, C. D., Summerville, B., Swafford, I., Witham, B., Hayward, M., Kwan, M. Y., & Brown, D. M. (2024). Associations between 24-h movement behaviors and indicators of mental health and well-being across the lifespan: a systematic review. *Journal of Activity, Sedentary and Sleep Behaviors*, *3*(1), 9.
- Guo, C., Tomson, G., Keller, C., & Söderqvist, F. (2018). Prevalence and correlates of positive mental health in Chinese adolescents. *BMC Public Health*, *18*, 1-11.
- Herzog-Krzywoszanska, R., & Krzywoszanski, L. (2019). Bedtime procrastination, sleep-related behaviors, and demographic factors in an online survey on a polish sample. *Frontiers in neuroscience*, *13*, 476005.
- Hori, D., Oi, Y., Ohtaki, Y., Andrea, C.-S., Takahashi, T., Shiraki, N., Ikeda, T., Ikeda, Y., Doki, S., & Sasahara, S. (2019). Association between flourishing mental health and occupational stress among workers of Tsukuba Science City, Japan: a cross-sectional study. *Environmental Health and Preventive Medicine*, *24*, 1-11.
- Howard, A., Li, A., & Bentley, R. (2023). Parental co-residence and young adults' mental health. *PLoS one*, *18*(11), e0294248.
- Howell, K. H., Coffey, J. K., Fosco, G. M., Kracke, K., Nelson, S. K., Rothman, E. F., & Grych, J. H. (2016). Seven reasons to invest in well-being. *Psychology of Violence*, *6*(1), 8.
- Iasiello, M., van Agteren, J., Keyes, C. L., & Cochrane, E. M. (2019). Positive mental health as a predictor of recovery from mental illness. *Journal of affective disorders*, *251*, 227-230.
- Jiang, W., Lu, Y., & Xie, H. (2020). Education and mental health: Evidence and mechanisms. *Journal of Economic Behavior & Organization*, *180*, 407-437.
- Joutsenniemi, K., Martelin, T., Martikainen, P., Pirkola, S., & Koskinen, S. (2006). Living arrangements and mental health in Finland. *Journal of Epidemiology & Community Health*, *60*(6), 468-475.
- Kahneman, D., & Deaton, A. (2010). High income improves evaluation of life but not emotional well-being. *Proceedings of the National Academy of Sciences*, *107*(38), 16489-16493.
- Karaś, D., Ciecuch, J., & Keyes, C. L. (2014). The polish adaptation of the mental health continuum-short form (MHC-SF). *Personality and individual differences*, *69*, 104-109.
- Kashdan, T. B., Biswas-Diener, R., & King, L. A. (2008). Reconsidering happiness: The costs of distinguishing between hedonics and eudaimonia. *The journal of positive psychology*, *3*(4), 219-233.

- Kessler, R. C., Angermeyer, M., Anthony, J. C., De Graaf, R., Demyttenaere, K., Gasquet, I., De Girolamo, G., Gluzman, S., Gureje, O., & Haro, J. M. (2007). Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World psychiatry*, 6(3), 168.
- Keyes, C. L. (2002). The mental health continuum: From languishing to flourishing in life. *Journal of health and social behavior*, 207-222.
- Keyes, C. L. (2005). Mental illness and/or mental health? Investigating axioms of the complete state model of health. *Journal of consulting and clinical psychology*, 73(3), 539.
- Keyes, C. L. (2006). Mental health in adolescence: is America's youth flourishing? *American journal of orthopsychiatry*, 76(3), 395-402.
- Keyes, C. L. (2007). Promoting and protecting mental health as flourishing: a complementary strategy for improving national mental health. *American psychologist*, 62(2), 95.
- Keyes, C. L., Dhingra, S. S., & Simoes, E. J. (2010). Change in level of positive mental health as a predictor of future risk of mental illness. *American journal of public health*, 100(12), 2366-2371.
- Keyes, C. L., Eisenberg, D., Perry, G. S., Dube, S. R., Kroenke, K., & Dhingra, S. S. (2012). The relationship of level of positive mental health with current mental disorders in predicting suicidal behavior and academic impairment in college students. *Journal of American college health*, 60(2), 126-133.
- Keyes, C. L., & Grzywacz, J. G. (2005). Health as a complete state: The added value in work performance and healthcare costs. *Journal of Occupational and Environmental Medicine*, 47(5), 523-532.
- Keyes, C. L., Shmotkin, D., & Ryff, C. D. (2002). Optimizing well-being: the empirical encounter of two traditions. *Journal of personality and social psychology*, 82(6), 1007.
- Keyes, C. L., & Simoes, E. J. (2012). To flourish or not: Positive mental health and all-cause mortality. *American journal of public health*, 102(11), 2164-2172.
- Keyes, C. L., Wissing, M., Potgieter, J. P., Temane, M., Kruger, A., & Van Rooy, S. (2008). Evaluation of the mental health continuum–short form (MHC–SF) in setswana-speaking South Africans. *Clinical psychology & psychotherapy*, 15(3), 181-192.
- Knoesen, R., & Naudé, L. (2018). Experiences of flourishing and languishing during the first year at university. *Journal of Mental Health*, 27(3), 269-278.
- Lamers, S. M., Westerhof, G. J., Bohlmeijer, E. T., ten Klooster, P. M., & Keyes, C. L. (2011). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF). *Journal of clinical psychology*, 67(1), 99-110.
- Lane, J. A. (2015). Counseling emerging adults in transition: Practical applications of attachment and social support research. *The Professional Counselor*.
- Lappan, S., Thorne, C. B., Long, D., & Hendricks, P. S. (2020). Longitudinal and reciprocal relationships between psychological well-being and smoking. *Nicotine and Tobacco Research*, 22(1), 18-23.
- Li, C., & Ning, G. (2022). More income, less depression? Revisiting the nonlinear and heterogeneous relationship between income and mental health. *Frontiers in Psychology*, 13, 1016286.
- Lipson, S. K., Zhou, S., Wagner III, B., Beck, K., & Eisenberg, D. (2016). Major differences: Variations in undergraduate and graduate student mental health and treatment utilization across academic disciplines. *Journal of college student psychotherapy*, 30(1), 23-41.

- Liu, D., Baumeister, R. F., Veilleux, J. C., Chen, C., Liu, W., Yue, Y., & Zhang, S. (2020). Risk factors associated with mental illness in hospital discharged patients infected with COVID-19 in Wuhan, China. *Psychiatry research*, 292, 113297.
- Lluch-Canut, T., Puig-Llobet, M., Sánchez-Ortega, A., Roldán-Merino, J., Ferré-Grau, C., & Group, P. M. H. R. (2013). Assessing positive mental health in people with chronic physical health problems: correlations with socio-demographic variables and physical health status. *BMC Public Health*, 13, 1-11.
- Løset, I. H., Lægreid, T., & Rodakowska, E. (2022). Dental students' experiences during the COVID-19 pandemic—A cross-sectional Study from Norway. *International journal of environmental research and public health*, 19(5), 3102.
- Love, N., Nelson, G., Pancer, S. M., Loomis, C., & Hasford, J. (2013). Generativity as a positive mental health outcome: The long-term impacts of Better Beginnings, Better Futures on youth at ages 18–19. *Canadian journal of community mental health*, 32(1), 155-169.
- Low, K. G. (2011). Flourishing, substance use, and engagement in students entering college: A preliminary study. *Journal of American college health*, 59(6), 555-561.
- Machado-Oliveira, L., da Silva, A. O., Farah, B. Q., Leão, I. C. S., Souza, F. T. C., Santiago, F. L., Machado, L., & Diniz, P. R. B. (2023). Team sports as a protective factor against mental health problems and suicidal ideation in adolescents. *Salud mental*, 46(4), 177-184.
- Manthey, J., Jacobsen, B., Hayer, T., Kalke, J., López-Pelayo, H., Pons-Cabrera, M. T., Verthein, U., & Rosenkranz, M. (2023). The impact of legal cannabis availability on cannabis use and health outcomes: a systematic review. *International Journal of Drug Policy*, 116, 104039.
- McQuillan, J., Greil, A. L., White, L., & Jacob, M. C. (2003). Frustrated fertility: Infertility and psychological distress among women. *Journal of marriage and family*, 65(4), 1007-1018.
- Medley, M. L. (1980). Life satisfaction across four stages of adult life. *The International Journal of Aging and Human Development*, 11(3), 193-209.
- Mjøsund, N. H. (2021). A salutogenic mental health model: Flourishing as a metaphor for good mental health. *Health promotion in health care—Vital theories and research*, 47-59.
- Modini, M., Joyce, S., Mykletun, A., Christensen, H., Bryant, R. A., Mitchell, P. B., & Harvey, S. B. (2016). The mental health benefits of employment: Results of a systematic meta-review. *Australasian Psychiatry*, 24(4), 331-336.
- Monteiro, F., Fonseca, A., Pereira, M., & Canavarro, M. C. (2021). Is positive mental health and the absence of mental illness the same? Factors associated with flourishing and the absence of depressive symptoms in postpartum women. *Journal of clinical psychology*, 77(3), 629-645.
- Morales-Muñoz, I., Mallikarjun, P. K., Chandan, J. S., Thayakaran, R., Upthegrove, R., & Marwaha, S. (2023). Impact of anxiety and depression across childhood and adolescence on adverse outcomes in young adulthood: A UK birth cohort study. *The British Journal of Psychiatry*, 222(5), 212-220.
- Moreno-Agostino, D., Wu, Y.-T., Daskalopoulou, C., Hasan, M. T., Huisman, M., & Prina, M. (2021). Global trends in the prevalence and incidence of depression: a systematic review and meta-analysis. *Journal of affective disorders*, 281, 235-243.
- Mucci, N., Giorgi, G., De Pasquale Ceratti, S., Fiz-Pérez, J., Mucci, F., & Arcangeli, G. (2016). Anxiety, stress-related factors, and blood pressure in young adults. *Frontiers in Psychology*, 7, 1682.

- Murray, R. M., Sabiston, C. M., Doré, I., Bélanger, M., & O'Loughlin, J. L. (2021). Association between pattern of team sport participation from adolescence to young adulthood and mental health. *Scandinavian journal of medicine & science in sports*, *31*(7), 1481-1488.
- Nasir, L. S., & Lacroix, A. E. (2022). Anxiety and Stress in Young Adults. In *Family Medicine: Principles and Practice* (pp. 481-488). Springer.
- Necka, E. A., Edwards, E., King, R. B., King, T. M., Miller, B., Nielsen, L., Quinlan, E. B., & Simmons, J. M. (2023). Why definitional clarity matters: Implications for the operationalization of emotional well-being. *Affective Science*, *4*(1), 24-28.
- Nelson, L. J. (2021). The theory of emerging adulthood 20 years later: A look at where it has taken us, what we know now, and where we need to go. *Emerging Adulthood*, *9*(3), 179-188.
- Nogueira, M. J., Seabra, P., Alves, P., Teixeira, D., Carvalho, J. C., & Sequeira, C. (2022). Predictors of positive mental health in higher education students. A cross-sectional predictive study. *Perspectives in Psychiatric Care*.
- Nomaguchi, K. M., & Milkie, M. A. (2003). Costs and rewards of children: The effects of becoming a parent on adults' lives. *Journal of marriage and family*, *65*(2), 356-374.
- O'Loughlin, J., Dugas, E. N., Brunet, J., DiFranza, J., Engert, J. C., Gervais, A., Gray-Donald, K., Karp, I., Low, N. C., & Sabiston, C. (2015). Cohort profile: the nicotine dependence in teens (NDIT) study. *International Journal of Epidemiology*, *44*(5), 1537-1546.
- O'Neal, C. W., & Wickrama, K. (2021). The contribution of stressful marital interactions to loneliness and health across mid-life and later adulthood. *Journal of family issues*, *42*(3), 553-570.
- O'Rourke, R. H., Dore, I., Sylvester, B. D., & Sabiston, C. M. (2023). Flourishing or physical activity?: Identifying temporal precedence in supporting the transition to university. *Journal of American college health*, *71*(1), 124-129.
- Orpana, H., Vachon, J., Dykxhoorn, J., & Jayaraman, G. (2017). Measuring positive mental health in Canada: construct validation of the Mental Health Continuum-Short Form. *Health Promot Chronic Dis Prev Can*, *37*(4), 123-130. <https://doi.org/10.24095/hpcdp.37.4.03> (Mesurer la santé mentale positive au Canada : validation des concepts du Continuum de santé mentale – Questionnaire abrégé.)
- Orpana, H., Vachon, J., Dykxhoorn, J., McRae, L., & Jayaraman, G. (2016). Monitoring positive mental health and its determinants in Canada: the development of the Positive Mental Health Surveillance Indicator Framework. *Health promotion and chronic disease prevention in Canada: research, policy and practice*, *36*(1), 1.
- Paradis, G., Lambert, M., O'Loughlin, J., Lavallée, C., Aubin, J., Berthiaume, P., Ledoux, M., Delvin, E. E., Lévy, E., & Hanley, J. A. (2003). The Québec Child and Adolescent Health and Social Survey: design and methods of a cardiovascular risk factor survey for youth. *The Canadian journal of cardiology*, *19*(5), 523-531.
- Patrick, M. E., Schulenberg, J. E., O'malley, P. M., Johnston, L. D., & Bachman, J. G. (2011). Adolescents' reported reasons for alcohol and marijuana use as predictors of substance use and problems in adulthood. *Journal of studies on alcohol and drugs*, *72*(1), 106-116.
- Porta, M. (2014). *A dictionary of epidemiology*. Oxford university press.
- Prince, S. A., Lang, J. J., Betancourt, M., Toigo, S., & Roberts, K. C. (2024). Sedentary time at school and work in Canada. *Canadian Journal of Public Health*, *115*(2), 343-355.
- Prince, S. A., Melvin, A., Roberts, K. C., Butler, G. P., & Thompson, W. (2020). Sedentary behaviour surveillance in Canada: trends, challenges and lessons learned. *International Journal of Behavioral Nutrition and Physical Activity*, *17*, 1-21.

- Ramaeker, J., & Petrie, T. A. (2019). "Man up!": Exploring intersections of sport participation, masculinity, psychological distress, and help-seeking attitudes and intentions. *Psychology of Men & Masculinities*, 20(4), 515.
- Rhew, I. C., Cadigan, J. M., & Lee, C. M. (2021). Marijuana, but not alcohol, use frequency associated with greater loneliness, psychological distress, and less flourishing among young adults. *Drug and alcohol dependence*, 218, 108404.
- Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual review of psychology*, 52(1), 141-166.
- Ryff, C. D. (2023). Contributions of eudaimonic well-being to mental health practice. *Mental health and social inclusion*, 27(4), 276-293.
- Salama-Younes, M. (2011). Validation of the mental health continuum short form and subjective vitality scale with Egyptian adolescent athletes. In *The human pursuit of well-being: A cultural approach* (pp. 221-234). Springer.
- Santini, Z. I., Nielsen, L., Hinrichsen, C., Nelausen, M. K., Meilstrup, C., Koyanagi, A., McDaid, D., Lyubomirsky, S., VanderWeele, T. J., & Koushede, V. (2021). Mental health economics: A prospective study on psychological flourishing and associations with healthcare costs and sickness benefit transfers in Denmark. *Mental Health & Prevention*, 24, 200222.
- Scanlon, L., Rowling, L., & Weber, Z. (2007). 'You don't have like an identity... you are just lost in a crowd': Forming a Student Identity in the First-year Transition to University. *Journal of youth studies*, 10(2), 223-241.
- Schaakxs, R., Comijs, H. C., van der Mast, R. C., Schoevers, R. A., Beekman, A. T., & Penninx, B. W. (2017). Risk factors for depression: differential across age? *The American Journal of Geriatric Psychiatry*, 25(9), 966-977.
- Schneider, M., & Koch, M. (2003). Chronic pubertal, but not adult chronic cannabinoid treatment impairs sensorimotor gating, recognition memory, and the performance in a progressive ratio task in adult rats. *Neuropsychopharmacology*, 28(10), 1760-1769.
- Schotanus-Dijkstra, M., Pieterse, M. E., Drossaert, C. H., Westerhof, G. J., De Graaf, R., Ten Have, M., Walburg, J., & Bohlmeijer, E. T. (2016). What factors are associated with flourishing? Results from a large representative national sample. *Journal of happiness studies*, 17, 1351-1370.
- Schulenberg, J. E., Bryant, A. L., & O'MALLEY, P. M. (2004). Taking hold of some kind of life: How developmental tasks relate to trajectories of well-being during the transition to adulthood. *Development and psychopathology*, 16(4), 1119-1140.
- Semkovska, M., Quinlivan, L., O'Grady, T., Johnson, R., Collins, A., O'Connor, J., Knittle, H., Ahern, E., & Glod, T. (2019). Cognitive function following a major depressive episode: a systematic review and meta-analysis. *The Lancet Psychiatry*, 6(10), 851-861.
- Shields-Zeeman, L., & Smit, F. (2022). The impact of income on mental health. *The Lancet Public Health*, 7(6), e486-e487.
- Shin, J.-e., & Kim, J. K. (2018). How a good sleep predicts life satisfaction: The role of zero-sum beliefs about happiness. *Frontiers in Psychology*, 9, 1589.
- Snodgrass, J. G., Lacy, M. G., & Upadhyay, C. (2017). Developing culturally sensitive affect scales for global mental health research and practice: Emotional balance, not named syndromes, in Indian Adivasi subjective well-being. *Social Science & Medicine*, 187, 174-183.

- Sofija, E., Harris, N., Phung, D., Sav, A., & Sebar, B. (2020). Does flourishing reduce engagement in unhealthy and risky lifestyle behaviours in emerging adults? *International journal of environmental research and public health*, *17*(24), 9472.
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*, *166*(10), 1092-1097.
- StatCan. (2022). From 1981 to 2021, living alone became more prevalent in younger adulthood. In.
- StatCan. (2023). Health characteristics, annual estimates, inactive. <https://www150.statcan.gc.ca/t1/tb11/en/tv.action?pid=1310009601>
- Stern, P. (2021). The many benefits of healthy sleep. In (Vol. 374, pp. 550-551): American Association for the Advancement of Science.
- Stewart-Brown, S., Samaraweera, P. C., Taggart, F., Kandala, N.-B., & Stranges, S. (2015). Socioeconomic gradients and mental health: implications for public health. *The British Journal of Psychiatry*, *206*(6), 461-465.
- Struik, L. L., O'Loughlin, E. K., Riglea, T., & O'Loughlin, J. L. (2022). Predictors of past-year e-cigarette use among young adults. *Preventive medicine reports*, *29*, 101965.
- Sylvia, L. G., Montana, R. E., Deckersbach, T., Thase, M. E., Tohen, M., Reilly-Harrington, N., McInnis, M. G., Kocsis, J. H., Bowden, C., & Calabrese, J. (2017). Poor quality of life and functioning in bipolar disorder. *International journal of bipolar disorders*, *5*, 1-8.
- Tamminen, N., Kettunen, T., Martelin, T., Reinikainen, J., & Solin, P. (2019). Living alone and positive mental health: a systematic review. *Systematic reviews*, *8*, 1-8.
- Tamminen, N., Reinikainen, J., Appelqvist-Schmidlechner, K., Borodulin, K., Mäki-Opas, T., & Solin, P. (2020). Associations of physical activity with positive mental health: A population-based study. *Mental Health and Physical Activity*, *18*, 100319.
- Tang, J., Galbraith, N., & Truong, J. (2019). Living alone in Canada.
- Teixeira, S. M. A., Coelho, J. C. F., Sequeira, C. A. d. C., Lluch i Canut, M. T., & Ferre-Grau, C. (2019). The effectiveness of positive mental health programs in adults: A systematic review. *Health & Social Care in the Community*, *27*(5), 1126-1134.
- Testai, F. D., Gorelick, P. B., Aparicio, H. J., Filbey, F. M., Gonzalez, R., Gottesman, R. F., Melis, M., Piano, M. R., Rubino, T., & Song, S. Y. (2022). Use of marijuana: effect on brain health: a scientific statement from the American Heart Association. *Stroke*, *53*(4), e176-e187.
- Thapar, A., Eyre, O., Patel, V., & Brent, D. (2022). Depression in young people. *The Lancet*, *400*(10352), 617-631.
- Thomas, P. A., Liu, H., & Umberson, D. (2017). Family relationships and well-being. *Innovation in aging*, *1*(3), igx025.
- Tran, H. T., Nguyen, M. H., Pham, T. T., Kim, G. B., Nguyen, H. T., Nguyen, N.-M., Dam, H. T., Duong, T. H., Nguyen, Y. H., & Do, T. T. (2022). Predictors of eHealth literacy and its associations with preventive behaviors, fear of COVID-19, anxiety, and depression among undergraduate nursing students: a cross-sectional survey. *International journal of environmental research and public health*, *19*(7), 3766.
- Tunvirachaisakul, C., Gould, R. L., Coulson, M. C., Ward, E. V., Reynolds, G., Gathercole, R. L., Grocott, H., Supasitthumrong, T., Tunvirachaisakul, A., & Kimona, K. (2018). Predictors of treatment outcome in depression in later life: a systematic review and meta-analysis. *Journal of affective disorders*, *227*, 164-182.

- Uecker, J. E. (2012). Marriage and mental health among young adults. *Journal of health and social behavior, 53*(1), 67-83.
- Umberson, D., & Karas Montez, J. (2010). Social relationships and health: A flashpoint for health policy. *Journal of health and social behavior, 51*(1_suppl), S54-S66.
- Vaingankar, J. A., Subramaniam, M., Abdin, E., Picco, L., Phua, A., Chua, B. Y., & Chong, S. A. (2013). Socio-demographic correlates of positive mental health and differences by depression and anxiety in an Asian community sample. *Ann Acad Med Singap, 42*(10), 514-523.
- Van der Hallen, R., Jongerling, J., & Godor, B. P. (2020). Coping and resilience in adults: a cross-sectional network analysis. *Anxiety, Stress, & Coping, 33*(5), 479-496.
- Van Dorn, R., Volavka, J., & Johnson, N. (2012). Mental disorder and violence: is there a relationship beyond substance use? *Social psychiatry and psychiatric epidemiology, 47*, 487-503.
- Van Lente, E., Barry, M. M., Molcho, M., Morgan, K., Watson, D., Harrington, J., & McGee, H. (2012). Measuring population mental health and social well-being. *International journal of public health, 57*, 421-430.
- VanderWeele, T. J. (2017). On the promotion of human flourishing. *Proceedings of the National Academy of Sciences, 114*(31), 8148-8156.
- Waterman, A. S., Schwartz, S. J., Zamboanga, B. L., Ravert, R. D., Williams, M. K., Bede Agocha, V., Yeong Kim, S., & Brent Donnellan, M. (2010). The Questionnaire for Eudaimonic Well-Being: Psychometric properties, demographic comparisons, and evidence of validity. *The journal of positive psychology, 5*(1), 41-61.
- Weatherston, K., Gierc, M., Patte, K., Qian, W., Leatherdale, S., & Faulkner, G. (2020). Complete mental health status and associations with physical activity, screen time, and sleep in youth. *Mental Health and Physical Activity, 19*, 100354.
- Webster, J. D., Westerhof, G. J., & Bohlmeijer, E. T. (2014). Wisdom and mental health across the lifespan. *Journals of gerontology series b: Psychological sciences and social sciences, 69*(2), 209-218.
- Weiland, S. (1993). Erik Erikson: Ages, stages, and stories. *Generations: Journal of the American Society on Aging, 17*(2), 17-22.
- Wellman, R. J., Contreras, G. A., Dugas, E. N., O'Loughlin, E. K., & O'Loughlin, J. L. (2014). Determinants of sustained binge drinking in young adults. *Alcoholism: clinical and experimental research, 38*(5), 1409-1415.
- Westerhof, G. J., & Keyes, C. L. (2010). Mental illness and mental health: The two continua model across the lifespan. *Journal of adult development, 17*, 110-119.
- Whiting, D., Lichtenstein, P., & Fazel, S. (2021). Violence and mental disorders: a structured review of associations by individual diagnoses, risk factors, and risk assessment. *The Lancet Psychiatry, 8*(2), 150-161.
- WHO. (2013). *The European mental health action plan. Conference document no. W. H. Organisation.*
- WHO. (2022). *World mental health report: Transforming mental health for all.* World Health Organization.
- Wiciak, M. T., Shazley, O., & Santhosh, D. (2022). An observational report of screen time use among young adults (ages 18-28 years) during the COVID-19 pandemic and correlations with mental health and wellness: international, online, cross-sectional study. *JMIR Formative Research, 6*(8), e38370.

- Wickham, S.-R., & Amarasekara, N. A. (2020). The big three health behaviors and mental health and well-being among young adults: a cross-sectional investigation of sleep, exercise, and diet. *Frontiers in Psychology, 11*, 579205.
- Winzer, R., Lindblad, F., Sorjonen, K., & Lindberg, L. (2014). Positive versus negative mental health in emerging adulthood: a national cross-sectional survey. *BMC Public Health, 14*, 1-10.
- Wyatt, T., & Oswalt, S. B. (2013). Comparing mental health issues among undergraduate and graduate students. *American journal of health education, 44*(2), 96-107.
- Yeretzian, S. T., Abrahamyan, L., & Sahakyan, Y. (2022). Evaluating Mood and Anxiety Disorders in Canada: A Population-Based Study.
- Yin, K. L., He, J. M., & Fu, Y. F. (2012). Positive mental health: Measurement, prevalence, and correlates in a Chinese cultural context. In *Mental well-being: International contributions to the study of positive mental health* (pp. 111-132). Springer.

Chapter 9 Appendices

APPENDIX A English Questionnaire for NDI Cycle 23, 2017-2020



Survey Cycle: 23

By returning your completed questionnaire to us, **YOU CONSENT** to participate in the questionnaire component of the NDIT Study. If you do not wish to participate, please return the blank questionnaire to us, so that we know you have decided not to complete it. Thank you very much for your help!

Name: _____

ID:

--	--	--	--	--	--	--	--

1. What is today's date?

Day	Month	Year

2. What is your home postal code?

--	--	--	--	--	--

3. Do you currently live alone?

- Yes → Go to question 5
 No

4. Do you live with your...? Check all that apply.

	Yes
Biological mother	<input type="checkbox"/>
Biological father	<input type="checkbox"/>
Step-mother	<input type="checkbox"/>
Step-father	<input type="checkbox"/>
Sister(s), step-sister(s), half-sister(s)	<input type="checkbox"/>
Brother(s), step-brother(s), half-brother(s)	<input type="checkbox"/>
Husband, wife	<input type="checkbox"/>
Partner (girlfriend, boyfriend)	<input type="checkbox"/>
Son(s), step-son(s)	<input type="checkbox"/>
Daughter(s), step-daughter(s)	<input type="checkbox"/>
Roommate(s)	<input type="checkbox"/>
Other (specify) _____	<input type="checkbox"/>

5. Does this person currently smoke cigarettes? Your....

	Yes
Biological mother	<input type="checkbox"/>
Biological father	<input type="checkbox"/>
Step-mother	<input type="checkbox"/>
Step-father	<input type="checkbox"/>
Any sister, step-sister, half-sisters	<input type="checkbox"/>
Any brother, step-brother, half-brother	<input type="checkbox"/>
Husband, wife	<input type="checkbox"/>
Partner (girlfriend, boyfriend)	<input type="checkbox"/>
Any son, step-son	<input type="checkbox"/>
Any daughter, step-daughter	<input type="checkbox"/>
Any roommate	<input type="checkbox"/>
Other (specify) _____	<input type="checkbox"/>

6. How many close friends (people you feel at ease with and can talk to about what is on your mind) do you have?

_____ Close friends

7. How many of your close friends smoke cigarettes?

_____ Close friends smoke

8. Indicate your level of agreement with the following...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I feel a bond with my close friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel that I am similar to my close friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a sense of belonging with my close friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have a lot in common with my close friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. Even if you do not currently smoke cigarettes, how often do you...?

	Never	Rarely	Sometimes	Often
Want to smoke a cigarette	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Need a cigarette	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crave a cigarette	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Even if you do not currently smoke cigarettes, how addicted to smoking cigarettes are you...?

	Not at all	A little bit	Quite	Very
Physically	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mentally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Have you ever in your life smoked a cigarette, even just a puff (drag, hit, haul)?

- No → Go to question 43
- Yes, 1 or 2 times
- Yes, 3 or 4 times
- Yes, 5 to 10 times
- Yes, more than 10 times

12. Check the box that describes you best...

- I have smoked cigarettes, but not at all in the past 12 months
- I smoked cigarettes once or a couple of times in the past 12 months
- I smoke cigarettes once or a couple of times each month
- I smoke cigarettes once or a couple of times each week
- I smoke cigarettes every day

13. Have you smoked 100 or more whole cigarettes (4 packs of 25) in your life?

- No
- Yes

14. How old were you when you took cigarette smoke into your lungs for more than one puff?

I was _____ years old

- I have never done this

15. Did you smoke cigarettes (even just a puff) in the past three months?

- No → Go to question 22
- Yes

16. During _____ (last month), on how many days did you smoke cigarettes, even just a puff?

- None → Go to question 18
- 1 day
- 2-3 days
- 4-5 days
- 6-10 days
- 11-15 days
- 16-20 days
- 21-30 days
- Every day
- Don't know

17. On the days that you smoked during _____ (last month), how many cigarettes did you usually smoke each day?

- Less than 1 cigarette (one or a few puffs)
- 1 cigarette
- 2-3 cigarettes
- 4-5 cigarettes
- 6-10 cigarettes
- 11-15 cigarettes
- 16-20 cigarettes
- 21-25 cigarettes
- More than 25
- Don't know

18. During _____ (2 months ago), on how many days did you smoke cigarettes, even just a puff?

- None → Go to question 20
- 1 day
- 2-3 days
- 4-5 days
- 6-10 days
- 11-15 days
- 16-20 days
- 21-30 days
- Every day
- Don't know

19. On the days that you smoked during _____ (2 months ago), how many cigarettes did you usually smoke each day?

- Less than 1 cigarette (one or a few puffs)
- 1 cigarette
- 2-3 cigarettes
- 4-5 cigarettes
- 6-10 cigarettes
- 11-15 cigarettes
- 16-20 cigarettes
- 21-25 cigarettes
- More than 25
- Don't know

20. During _____ (3 months ago), on how many days did you smoke cigarettes, even just a puff?

- None → Go to question 22
- 1 day
- 2-3 days
- 4-5 days
- 6-10 days
- 11-15 days
- 16-20 days
- 21-30 days
- Every day
- Don't know

21. On the days that you smoked during _____ (3 months ago), how many cigarettes did you usually smoke each day?

- Less than 1 cigarette (one or a few puffs)
- 1 cigarette
- 2-3 cigarettes
- 4-5 cigarettes
- 6-10 cigarettes
- 11-15 cigarettes
- 16-20 cigarettes
- 21-25 cigarettes
- More than 25
- Don't know

22. Do you smoke cigarettes now because it is really hard to quit?

- No
- Sometimes
- Often/always
- Never tried to quit
- Other (please explain) _____
- Don't know (I smoke so little)

23. When you cut down or stop using cigarettes, or when you are not able to smoke for a long period (like most of the day), how often do you experience...?

	Never	Rarely	Sometimes	Often
Feeling irritable or angry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feeling restless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feeling nervous, anxious, or tense	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trouble concentrating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feeling a strong urge or need to smoke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trouble sleeping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

24. How well do each of the following describe you?

	Describes me...			
	Not at all	A little	Pretty well	Very well
If I go too long without a cigarette, I begin to feel angry or irritable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I go too long without a cigarette, I feel stressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I usually want to smoke or use dip right after I wake up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I go too long without smoking, the first thing I notice is a mild desire to smoke that I can ignore	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I go too long without smoking, the desire for a cigarette becomes so strong that it is hard to ignore and it interrupts my thinking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I go too long without smoking, I just can't function right, and I know I will have to smoke just to feel normal again	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. When you see other people smoking cigarettes, how easy is it for you not to smoke?

- Very easy
- Quite easy
- A bit difficult
- Very difficult

26. How long can you go without smoking a cigarette before you feel a strong desire to smoke that is hard to ignore?

- Less than an hour
- 1-2 hours
- 3-5 hours
- 6-10 hours
- 11-15 hours
- 16-23 hours
- 1 day
- 2 days
- More than 2 days, less than a week
- A week or more
- Other (specify) _____

27. How deeply do you usually inhale?

- Just into my mouth
- Back into my throat
- Into my lungs shallow
- Into my lungs deep
- Don't know (I smoke so little)

28. On the days that you smoke, how soon after you wake up do you smoke your first cigarette?

- Within 5 minutes
- 6 - 30 minutes after waking
- 31 - 60 minutes after waking
- More than 60 minutes after waking

29. Do you find it difficult to refrain from smoking in places where it is forbidden?

- Not at all difficult
- A bit difficult
- Very difficult

30. Do you smoke more frequently during the first hours after waking, compared with the rest of the day?

- No
- Yes

31. If you are sick with a bad cold or sore throat, do you smoke?

- No, I stop smoking when I'm sick
- Yes, but I cut down on the amount I smoke
- Yes, I smoke the same amount as when I'm not sick

32. How true is each of the following for you?

	Not at all true	A bit true	Very true
Cigarettes are good for dealing with boredom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A cigarette gives me energy when I'm tired	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When I'm feeling down, a cigarette makes me feel good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoking cigarettes calms me down when I feel nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoking cigarettes helps me control my weight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoking cigarettes helps me concentrate on my work/homework	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoking cigarettes relieves tension when I am stressed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I consider myself to be a social smoker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I avoid going to a friend's house where you're not allowed to smoke even though I might enjoy hanging out with him/her	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In situations where I need to go outside to smoke, it's worth it even in cold or rainy weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have cut down or stopped physical activities or sports because of my smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can function much better in the morning after I've had a cigarette	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compared to when I first started smoking, I need to smoke a lot more now to be satisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compared to when I first started smoking, I can smoke much more now before I start to feel nauseated or ill	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<u>OR</u>			
<input type="checkbox"/> I've never felt nauseated or ill from smoking			
I often run out of cigarettes quicker than I thought I would	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I spend a lot of time getting cigarettes (going out of my way to buy cigarettes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I spend a lot of time smoking cigarettes (chain smoking, smoking a lot throughout the day)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I've stopped hanging out with certain people because of my smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

33. How often do you have cravings to smoke cigarettes?

- Never → Go to question 35
- Very rarely
- Sometimes
- Often
- Very often

34. How strong are your cravings to smoke cigarettes?

- Not at all strong
- A bit strong
- Quite strong
- Very strong

35. Which cigarette would you most hate to give up?

- The first one of the day
- Another one
- Don't know (I smoke so little)

36. At this point in time, how much do you really want to quit smoking cigarettes completely and forever?

- Not at all
- A little bit
- Quite a bit
- A whole lot

37. In the last 12 months, did you seriously try to quit smoking cigarettes completely and forever?

- No
- Yes, once
- Yes, two or more times

38. When was the last time you made a serious attempt to quit smoking cigarettes?

- Never made a serious attempt to quit smoking
- ____ day(s) ago
- ____ month(s) ago
- ____ year(s) ago

39. How confident are you that you can or that you have quit smoking cigarettes completely and forever?

- Very confident
- Fairly confident
- Not very confident
- Not at all confident

40. Think about the last time you tried to quit smoking cigarettes. Did you quit smoking completely (for a while)?

- Never tried to quit
- No, but I cut down a lot
- No, but I cut down a little
- No, the amount I smoke didn't change at all
- Yes → I quit completely for _____ days
- Yes → I quit completely and have remained non-smoking ever since

41. How true for you are each of the following reasons to quit smoking cigarettes?

	Not at all true	A little true	Moderately true	Quite true	Extremely true
Because I am concerned that I will suffer from a serious illness if I don't quit smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To show myself that I can quit smoking if I really want to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
So that my hair and clothes won't smell	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
So that my spouse, children, or another person I am close to will stop nagging me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I have noticed physical symptoms that smoking is hurting my health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I will like myself better if I quit smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
So that I will save money on smoking-related costs such as dry cleaning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because someone has given me an ultimatum to quit (made a threat)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I can graphically picture the effects that smoking has on my body	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
So that I can feel in control of my life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I won't burn holes in clothing or furniture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I will receive a special gift if I quit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I know other people who have died from serious illnesses caused by smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because quitting smoking will prove that I can accomplish other things that are important to me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I want to save the money that I spend on cigarettes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because people I am close to will be upset with me if I don't quit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I am concerned that smoking will shorten my life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
To prove to myself that I am not addicted to cigarettes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
So that I won't have to clean my house or car as often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I will receive a financial reward (money from a friend or family member, bonus from work) for quitting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I want to set a good example for my children	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because I (or my partner) is pregnant or planning to become pregnant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Because my doctor advised me to quit smoking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

42. Did you ever try any of the following to help you quit smoking cigarettes? If yes, was this in the past 12 months? Did it help you to quit?

	Ever tried	Tried in the past 12 months	Helped me quit
	Yes	Yes	Yes
Nicotine patch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nicotine gum (Nicorette)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nicotine inhaler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zyban, Wellbutrin, Bupropion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Varenicline (Champix)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electronic cigarettes with nicotine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electronic cigarettes without nicotine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cold Turkey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cutting down by only smoking at certain times or in certain situations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not having cigarettes with me (threw them out)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using other drugs (alcohol, marijuana, sleeping pills) more often	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spending more time with friends who don't smoke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keeping myself occupied by doing other things	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using a quit smoking APP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using a quit smoking SMS program (SMAT)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

43. Are there any restrictions on smoking cigarettes in your home? Check all that apply.

- No; smoking is permitted anywhere in my home anytime
- Yes; smoking is not permitted at all inside my home
- Yes; smoking is permitted in certain rooms only
- Yes; smoking is restricted in the presence of children
- Yes; other (specify) _____

44. Are there any restrictions on smoking cigarettes in your car or in the car you travel in most often? Check all that apply.

- No; smoking is permitted anytime
- Yes; smoking is not permitted at all in the car
- Yes; smoking is not permitted when there are children in the car
- Not applicable (I do not/inrequently travel by car)

45. How many people smoke cigarettes inside your home every day or almost every day?

- None OR _____ people

46. In the past month, how often were you exposed to second-hand smoke...?

	Never	Rarely	Sometimes	Fairly often	Very often
Inside your home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In a car or other private vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inside public places (bars, restaurants, shopping malls, arenas)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
When visiting the homes of friends or relatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outside a restaurant on a patio or terrace	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At school	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (specify) _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

47. In the past 12 months, how many organized sports teams did you belong to (where you practice with teammates or play against other teams)?

None OR _____ teams

48. In the last 7 days, on how many days did you do vigorous physical activities (heavy lifting, digging, aerobics, fast bicycling) for at least 10 minutes at a time?

None → Go to question 50

_____ days in the last 7 days

49. On the days that you did vigorous physical activities, how many minutes did you usually spend per day?

_____ minutes per day

50. In the last 7 days, on how many days did you do moderate physical activities (carrying light loads, bicycling at a regular pace, doubles tennis) for at least 10 minutes? Do not include walking.

None → Go to question 52

_____ days in the last 7 days

51. On the days that you did moderate physical activities, how many minutes did you usually spend per day?

_____ minutes per day

52. In the last 7 days, on how many days did you walk for at least 10 minutes at a time?

None → Go to question 54

_____ days in the last 7 days

53. On the days that you walked, how many minutes did you usually spend walking per day?

_____ minutes per day

54. To what extent is each of the following true for you?

	Not true	Rarely true	Sometimes true	Often true	Very often true
It's important to me to exercise regularly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I don't see why I should have to exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exercise because it's fun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel guilty when I don't exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exercise because it's consistent with my life goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exercise because other people say I should	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I value the benefits of exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I can't see why I should bother exercising	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I enjoy my exercise sessions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel ashamed when I miss an exercise session	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I consider exercise part of my identity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I take part in exercise because my friends/family/partner say I should	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think it's important to make the effort to exercise regularly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I don't see the point in exercising	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I find exercise a pleasurable activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel like a failure when I haven't exercised in a while	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I consider exercise a fundamental part of who I am	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exercise because others will not be pleased with me if I don't	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I get restless if I don't exercise regularly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think exercising is a waste of time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I get pleasure and satisfaction from participating in exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I would feel bad about myself if I was not making time to exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I consider exercise consistent with my values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel under pressure from my friends/family to exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

55. How true are each of the following for you? When I exercise, I feel like...

	False	Mostly false	More false than true	More true than false	Mostly true	True
I engage in a variety of exercises	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I try a range of exercises	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I change the type of exercise that I do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My exercise program is varied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I experience variety in my exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

56. How many of your close friends ...?

	None	A few	Some	Most	All
Exercise most days of the week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are physically active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

57. How important is it for your close friends to...?

	Not very important	Somewhat important	Very important
Exercise most days of the week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Be physically active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

58. Indicate your level of agreement with the following. My close friends ...

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Encourage me to be physically active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Would disapprove if they saw me just sitting around	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Think I should exercise most days of the week	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Think I should be physically active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

59. During one hour of sitting in a typical 7-hour (work)day, how many breaks from sitting (standing up, stretching, taking a short walk) do you usually take? Write "0" if you usually do not take any breaks.

_____ break(s)

60. In a typical 7-hour (work)day, how many minutes do you spend in short physical activity breaks? Write "0" if you usually do not take any breaks.

_____ minute(s)

61. Which statement best describes your usual daily activities or work habits in the past 3 months?

- Usually sit during the day and don't walk around very much
- Stand or walk quite a lot during the day but don't have to carry or lift things very often
- Usually lift or carry light loads, or have to climb stairs or hills often
- Do heavy work or carry very heavy loads

62. Do you consider yourself....?

- Too thin
- Just about right
- A little too heavy
- Much too heavy

63. How much do you weigh?

_____ pounds OR _____ kilograms

64. How tall are you without your shoes on?

_____ feet _____ inches OR _____ meters _____ cm

65. Currently, what are you doing about your weight?

- I'm trying to lose weight
- I'm trying to gain weight
- I want to maintain my weight
- I'm not doing anything about my weight

66. Are you or your partner currently pregnant?

- No/Not applicable → Go to question 68
- Yes, I am pregnant
- Yes, my partner is pregnant

67. How many weeks pregnant are you or your partner?

_____ week(s) pregnant

68. How often do you overeat (eat more than usual, more than you wanted, more than you think is good for you)?

- Never → Go to question 70
- Rarely
- Sometimes
- Often
- Very often

69. Do you do any of the following to compensate for overeating during the 24 hours after overeating?

	Never	Rarely	Sometimes	Often	Very often
Exercise or go for a walk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Purge (vomit) or use laxatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skip meals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Give up on my diet for the rest of the day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eat fruits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eat vegetables	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eat more high-protein foods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eat fewer fried foods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eat fewer sweets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eat foods that are low in calories	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eat more because I blew my diet for the day	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do nothing differently	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

70. In the past 2 years, how often did people in your life...?

	Never	Rarely	Sometimes	Often	Always
Make negative comments about your weight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encourage you to lose weight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encourage you to gain weight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

71. How many hours per day do you usually spend in front of a screen (computer, hand-held device) for work or for school? Write "0" if none. Write "LT ½" if less than ½ hour.

On weekdays, I usually spend _____ hour(s) per day in front of a screen for work or school

On weekends, I usually spend _____ hour(s) per day in front of a screen for work or school

72. How many hours per day, during your leisure time, do you usually spend in front of a screen (computer, TV, hand-held device)? Write "0" if none. Write "LT ½" if less than ½ hour.

On weekdays, I usually spend _____ hour(s) per day in front of a screen in my leisure time

On weekends, I usually spend _____ hour(s) per day in front of a screen in my leisure time

73. How many minutes per day do you usually spend on social media (Facebook, Twitter, Instagram, Snapchat) posting or browsing? Write "0" if none. Write "LT ½" if less than ½ hour.

On weekdays, I usually spend _____ minute(s) per day posting or browsing on social media

On weekends, I usually spend _____ minute(s) per day posting or browsing on social media

74. How many times per day OR per week OR per month (ANSWER ONLY ONE) do you eat or drink the following foods?

	Never	or	Times per day	or	Times per week	or	Times per month
Donuts or cakes or pastries	<input type="checkbox"/>	or		or		or	
Candy or chocolate bars	<input type="checkbox"/>	or		or		or	
Ice cream/frozen yogurt	<input type="checkbox"/>	or		or		or	
Potato chips, Fritos, Doritos	<input type="checkbox"/>	or		or		or	
Diet soft drinks	<input type="checkbox"/>	or		or		or	
Regular soft drinks	<input type="checkbox"/>	or		or		or	
Deli or charcuterie meats	<input type="checkbox"/>	or		or		or	
Fried chicken (Kentucky)	<input type="checkbox"/>	or		or		or	
Hot dogs	<input type="checkbox"/>	or		or		or	
Hamburgers	<input type="checkbox"/>	or		or		or	
French fries or poutine	<input type="checkbox"/>	or		or		or	
Bacon or sausages	<input type="checkbox"/>	or		or		or	
100% fruit juice (orange, grapefruit, or tomato juice)	<input type="checkbox"/>	or		or		or	
Fruit (not including juice)	<input type="checkbox"/>	or		or		or	
Green salad	<input type="checkbox"/>	or		or		or	
Potatoes (not including French fries, fried potatoes, potato chips)	<input type="checkbox"/>	or		or		or	
Carrots	<input type="checkbox"/>	or		or		or	
Other vegetables (not including carrots, potatoes, green salad)	<input type="checkbox"/>	or		or		or	
Walnuts, seeds or other nuts and nut butters (including peanuts or peanut butter)	<input type="checkbox"/>	or		or		or	
Milk (including chocolate milk, hot chocolate, café au lait, in cereal)	<input type="checkbox"/>	or		or		or	
Milk alternatives (almond, soy, rice)	<input type="checkbox"/>	or		or		or	
Yogurt, kefir, excluding frozen yogurt	<input type="checkbox"/>	or		or		or	
Processed cheese slices or spreads (Kraft slices, Vache Qui Rit, Cheez Wiz, Velveeta)	<input type="checkbox"/>	or		or		or	
Other cheeses	<input type="checkbox"/>	or		or		or	
Cereal (hot or cold)	<input type="checkbox"/>	or		or		or	
Rice and other grains (quinoa)	<input type="checkbox"/>	or		or		or	

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	Never		Times per day		Times per week		Times per month
Pasta, couscous	<input type="checkbox"/>	or		or		or	
Bread, bagels, pita, tortilla wraps	<input type="checkbox"/>	or		or		or	
Red Meat (beef, pork, lamb, horse, veal)	<input type="checkbox"/>	or		or		or	
Chicken/poultry	<input type="checkbox"/>	or		or		or	
Fresh/frozen fish and fish products (canned tuna)	<input type="checkbox"/>	or		or		or	
Seafood (shrimp, lobster, scallops)	<input type="checkbox"/>	or		or		or	
Tofu, Veggie burgers, Veggie hot dogs, TVP	<input type="checkbox"/>	or		or		or	
Eggs and egg dishes	<input type="checkbox"/>	or		or		or	
Cooked/canned dried peas, lentils, beans, Falafel, Hummus	<input type="checkbox"/>	or		or		or	
Pizza (frozen, fast-food or delivery)	<input type="checkbox"/>	or		or		or	
Frozen meals	<input type="checkbox"/>	or		or		or	
Tea and tisanes	<input type="checkbox"/>	or		or		or	
Coffee	<input type="checkbox"/>	or		or		or	

75. Have you ever exergamed (played an active videogame) that uses a console (Nintendo Wii, XBOX 360, Kinect, Sony Play Station Move, Sony Eye Toy: Kinetic), a cell phone or a mobile APP (RUN!, Nike+ Running APP, Pokémon Go)?

- No → Go to question 83
 Yes

76. In the past 12 months, how often did you exergame...?

	Never	Less than once a month	1-3 times per month	1-3 times a week	4-6 times per week	Every day
Using a console	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Using a cellphone or mobile APP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

77. In the past month, how many days per week did you exergame?

- None → Go to question 80

_____ days per week

78. On average, how many minutes did you spend each time you exergamed?

_____ minutes on average

79. In the past month, what was your usual level of effort when you exergamed?

- Light
- Moderate
- Intense

80. How true is each of the following for you?

	Completely false	Slightly false	Neither true nor false	Slightly True	Completely true
I like to exergame	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer exergaming over outdoor sports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer exergaming over indoor sports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like to exergame with friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like to exergame with my family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think that exergaming is a good way to integrate physical activity into my life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I think that I will exergame for many years	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Given the chance I would exergame in my free time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exergaming is boring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer exergaming over traditional video games	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exergames are irritating to play	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exergames are calming to play	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer exergaming over watching TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I prefer exergaming over being on social media (facebook, instagram, snapchat)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exergaming is exciting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exergame to be more active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exergame to lose weight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exergame to maintain my weight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exergame to maintain my level of fitness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exergame to gain strength	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exergame to "bulk up"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exergame to gain flexibility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exergame to gain balance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exergame just for fun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I exergame to be social	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Exergaming is the only type of videogame I like	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Videogames other than exergames bore me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

81. How often do you exergame...?

	Never	Rarely	Sometimes	Often	Very often
Alone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
With friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
With family	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

82. How important are the following in motivating you to continue exergaming...?

	Very important	Important	Neither important nor unimportant	Unimportant	Very unimportant
I am able to play well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game gets harder as you progress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The goal of the game (winning, scoring high point totals) is easy to understand	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tips in the game help me play better	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game provides feedback on how to improve my play	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like the sound effects in the game	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel like I am really part of what is happening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game is addictive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I lose track of time while playing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game provides interesting options and choices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I try to figure out new ways to play the game	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel like I can control what is happening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Learning the game controls (Wii-mote, Kinect, PS Move) is easy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel like my movements control the game	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game is challenging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game keeps me on my toes, but does not overwhelm me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game includes challenges within each level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I know what I have to do to win	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game provides feedback on how I am doing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am able to practice skills within a game, which helps me play better	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like the graphics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Very important	Important	Neither important nor unimportant	Unimportant	Very unimportant
I discover new things about the game the more I play	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I find myself getting totally absorbed in the game	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game allows me to do interesting things	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am able to play the game the way I want to	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The game controller (tennis racquet, bowling ball) tracks my movements well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
If I want to do something in the game, it is easy to remember the correct control (Wii-mote, Kinect, PS Move)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

83. In general, how would you rate...?

	Poor	Fair	Good	Very good	Excellent
Your health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your mental health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your ability to handle unexpected and difficult problems (a family or personal crisis)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your ability to handle day-to-day demands in your life (work, family responsibilities)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The overall quality of your sleep at night	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The quality of your sleep in the past month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

84. How often do you feel...?

	Never	Rarely	Sometimes	Often	Always
Ashamed of the way you look	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proud that you are more attractive than others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proud that you are a good-looking person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inadequate when you think about your appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ashamed of your appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proud of your superior appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proud of the effort you place on maintaining your appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proud of your efforts to improve the way you look	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proud that you have achieved your appearance goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proud of your appearance efforts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ashamed that you are a person who is unattractive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Guilty that you do not do enough to improve the way you look	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Guilty that you look the way you do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regret that you do not work on improving your appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regret that you do not put effort into your appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proud that you are an attractive person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Envious of another person's appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inferior when you think about your appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Frustrated to see some people who have a great appearance with little effort	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unfair that some people have the "perfect" appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Embarrassed about your appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Foolish when your body and appearance are on display	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Awkward when you are trying to improve your appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nervous when you think about others seeing your appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

85. Indicate your level of agreement with the following...

	Strongly agree	Agree	Disagree	Strongly disagree
On the whole, I am satisfied with myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At times, I think I am no good at all	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel that I have a number of good qualities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am able to do things as well as most other people	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel I do not have much to be proud of	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I certainly feel useless at times	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel that I'm a person of worth, at least on an equal place with others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I wish I could have more respect for myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All in all, I am inclined to feel that I am a failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I take a positive attitude toward myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

86. Has a health professional ever diagnosed you with the following? How old were you when first diagnosed?

	Yes	Age first diagnosed
Asthma	<input type="checkbox"/>	___ years
Migraine headaches	<input type="checkbox"/>	___ years
Food allergies	<input type="checkbox"/>	___ years
Other allergies	<input type="checkbox"/>	___ years
Thyroid condition	<input type="checkbox"/>	___ years
Mood disorder (depression, bipolar disorder)	<input type="checkbox"/>	___ years
Anxiety disorder (phobia, fear of social situations, obsessive-compulsive disorder, panic disorder, generalized anxiety disorder)	<input type="checkbox"/>	___ years
Learning disability (attention deficit disorder, dyslexia)	<input type="checkbox"/>	___ years
Eating disorder (anorexia, bulimia)	<input type="checkbox"/>	___ years
Back problems	<input type="checkbox"/>	___ years
Intestinal or stomach ulcers	<input type="checkbox"/>	___ years
Bowel disorder (Crohn's disease, ulcerative colitis, irritable bowel)	<input type="checkbox"/>	___ years
Cholesterol or lipid problems	<input type="checkbox"/>	___ years
Diabetes (type 1)	<input type="checkbox"/>	___ years
Diabetes (type 2)	<input type="checkbox"/>	___ years
High blood pressure (hypertension)	<input type="checkbox"/>	___ years
Insomnia	<input type="checkbox"/>	___ years
Obstructive sleep apnea	<input type="checkbox"/>	___ years
Other sleep disorder	<input type="checkbox"/>	___ years
Concussion	<input type="checkbox"/>	___ years
Other (specify) _____	<input type="checkbox"/>	___ years

87. In the past month, did you take any of the following medications, either prescription or over-the-counter?

	Yes
Pain relievers (aspirin, Tylenol, arthritis medicine, anti-inflammatories)	<input type="checkbox"/>
Tranquilizers (Valium, Ativan)	<input type="checkbox"/>
Diet pills (Ponderal, Fastin)	<input type="checkbox"/>
Anti-depressants (Prozac, Paxil, Effexor)	<input type="checkbox"/>
Codeine, Demerol or morphine	<input type="checkbox"/>
Allergy medicine (Allegra, Reactine)	<input type="checkbox"/>
Asthma medications (inhalers, nebulizers)	<input type="checkbox"/>
Cough or cold remedies	<input type="checkbox"/>
Penicillin or other antibiotics	<input type="checkbox"/>
Mood stabilizers (Lithium, Epival)	<input type="checkbox"/>
Major tranquilizers, anti-psychotics, neuroleptics (Risperidol, Olanzapine, Seroquel)	<input type="checkbox"/>
Thyroid medication (Synthroid, Levothyroxine)	<input type="checkbox"/>
Steroids	<input type="checkbox"/>
Insulin	<input type="checkbox"/>
Pills to control blood sugar levels	<input type="checkbox"/>
Sleeping pills (Imovane, Nytol, Starnoc, melatonin)	<input type="checkbox"/>
Stomach remedies	<input type="checkbox"/>
Laxatives	<input type="checkbox"/>
Birth control pills	<input type="checkbox"/>
Blood pressure medication	<input type="checkbox"/>
Cholesterol pills (Lipitor, Statins)	<input type="checkbox"/>
Other (specify) _____	<input type="checkbox"/>

88. Thinking about the amount of stress in your life, would you say that most days are...?

- Not at all stressful
- Not very stressful
- A bit stressful
- Quite stressful
- Extremely stressful

89. In the past two weeks, how much of the time have you...?

	At no time	Some of the time	Slightly less than half of the time	Slightly more than half of the time	Most of the time	All the time
Felt low in spirits or sad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lost interest in, or could no longer enjoy your daily activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Felt lacking in energy and strength	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Felt less self-confident	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Had a bad conscience or feelings of guilt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Felt that life wasn't worth living	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Had difficulty concentrating (when reading the newspaper or watching TV)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Felt very restless	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Felt subdued or slowed down	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Had trouble sleeping at night or waking up too early	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Suffered from reduced appetite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Suffered from increased appetite	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

90. Have you ever...?

	Yes
Seriously considered committing suicide (taking your own life)	<input type="checkbox"/>
Attempted to commit suicide (tried taking your own life)	<input type="checkbox"/>
Spoken to a health professional about your suicidal thoughts	<input type="checkbox"/>

91. In the past 2 weeks, how often have you been bothered by ...?

	Not at all	Several days	Over half the days	Nearly every day
Feeling nervous, anxious, or on edge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not being able to stop or control worrying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worrying too much about different things	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Trouble relaxing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Being so restless that it's hard to sit still	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Becoming easily annoyed or irritable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feeling afraid as if something awful might happen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

92. In the past month, how often did you feel...?

	Never	Rarely	Sometimes	Often	Most of the time	Always
Happy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interested in life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Satisfied	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
You had something important to contribute to society	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
You belonged to a community (like a social group, or your neighborhood)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
That our society is becoming a better place for people like you	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
That people are basically good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
That the way our society works makes sense to you	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
That you liked most parts of your personality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Good at managing the responsibilities of your daily life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
You had warm and trusting relationships with others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
You had experiences that challenged you to grow and become a better person	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Confident to think or express your own ideas and opinions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Your life has a sense of direction or meaning to it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

93. In the past 12 months, how often did you...?

	Never	Less than once a month	1-3 times per month	1-8 times per week	Every day
Use electronic cigarettes without nicotine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use electronic cigarettes with nicotine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use electronic cigarettes to smoke marijuana, hash oil, liquid or wax	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoke flavored cigarettes or cigarillos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoke cigars or a pipe, use bidis, chewing tobacco and/or snuff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smoke cigarillos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a waterpipe (hubble bubble, nargilé, shisha)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drink energy drinks (Red Bull, Monster) without alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drink energy drinks mixed with alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drink alcoholic beverages (beer, wine, liquor)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drink 5 or more alcoholic beverages on one occasion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use pain relief pills (Percocet, Percodan, Demerol, OxyNeo, OxyCotin, codeine) without a prescription or without a doctor telling you to take them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use marijuana, cannabis or hashish without tobacco	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use marijuana, cannabis or hashish mixed with tobacco	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use cocaine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use speed (amphetamines)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use ecstasy (MDMA) or other similar drugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use hallucinogens (PCP, LSD (acid), mushrooms)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use inhalants (glue, gasoline)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use heroin (smack, junk)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use another illicit drug	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Play games (cards, bingo, dice) for money	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bet money (slot machines, sports pool, casino, over the Internet)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Buy lottery tickets (6-49, Sports Select, Instant lottery, Scratch and win)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use a smartphone APP (Moves and Strava) that monitors your physical activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wear a fitness device (Fitbit, Jawbone, Apple Watch) that monitors your physical activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

94. In the past month, what time did you usually go to bed at night?

95. In the past month, how long has it usually taken you to fall asleep at night?

_____ minutes

96. In the past month, what time did you usually get up in the morning?

97. In the past month, how many hours of actual sleep did you usually get at night?

_____ hours of sleep

98. In the past month, how often did you experience each of the following?

	Never	Less than once a week	1-2 times per week	3 or more times per week
Unable to get to sleep within 30 minutes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Woke up in the middle of the night or early morning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Had to get up to use the bathroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Could not breathe comfortably while sleeping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coughed or snored loudly	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Felt too cold while sleeping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Felt too hot while sleeping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Had bad dreams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Had pain while sleeping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Took prescribed or "over the counter" medicine to help you sleep	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Had trouble staying awake while driving, eating meals, engaging in social activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

99. In the past month, has it been a problem for you to keep up enough enthusiasm to get things done?

- No problem at all
- Only a very slight problem
- Somewhat of a problem
- A very big problem

100. How long before going to bed at night do you usually...?

	Less than 30 minutes	Between 30-59 minutes	Between 1-2 hours	More than 2 hours	Not applicable
Smoke cigarettes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do physical activity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drink coffee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drink alcohol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use marijuana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use screens (TV, iPad, reading tablet, smartphone)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Meditate or do yoga	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

101. How true are each of the following for you...?

	Not at all true	A bit true	Very true
Cigarette ads are 'cool'	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ads in magazines tell the truth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TV ads are boring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TV beer commercials make me want to be like the people in them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like to read ads in magazines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Warnings on cigarettes packages make me afraid to smoke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I like to watch TV ads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cigarette ads make me want to smoke	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ads make us buy things we don't really need	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
People who smoke are very influenced by cigarette ads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ads help keep people up to date about new products	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I usually want the products advertised on TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

102. People living in Canada come from many backgrounds. Are you...?

- White (British, French, Italian, Portuguese, Ukrainian, Russian, Israeli)
- Chinese
- South Asian (East Indian, Pakistani, Bangladeshi, Sri Lankan)
- Black
- Latin American, Central American, South American (Mexican, Brazilian, Chilean, Guatemalan, Venezuelan, Colombian, Argentinian, Salvadorian, Costa Rican)
- Southeast Asian (Cambodian, Indonesian, Laotian, Vietnamese, Malaysian)
- Arabic
- West Asian (Afghan, Iranian)
- Aboriginal (First Nations, Inuit, Métis, non-status Indian)
- Japanese
- Other (specify) _____

103. How far have you gone in school?

- Attended high school, but did not graduate
- Graduated high school
- Attended CEGEP, community/technical college, but did not graduate
- Graduated CEGEP, community/technical college
- Attended university (or teacher's college), but did not graduate
- Graduated university with a Bachelor's degree
- Graduated university with a Master's degree
- Graduated university with a PhD
- Other (specify) _____

104. What is your current marital status?

- Single
- Married
- Common-law
- Divorced
- Separated
- Other (specify) _____

105. Are you currently enrolled as a full- or part-time student?

- No
- Yes, Full-time. Where? _____
- Yes, Part-time. Where? _____

106. Are you currently working at a job or business (paid or unpaid)?

- No → Go to question 108
- Yes

107. About how many hours per week do you usually work at your job/business (paid or unpaid)?

_____ hours per week

108. What is your best estimate of the total income, before taxes and deductions, of all household members from all sources in the past 12 months?

- | | |
|--|--|
| <input type="checkbox"/> Less than \$20 000 | <input type="checkbox"/> 70 000\$ - 79 999\$ |
| <input type="checkbox"/> 20 000\$ - 29 999\$ | <input type="checkbox"/> 80 000\$ - 99 999\$ |
| <input type="checkbox"/> 30 000\$ - 39 999\$ | <input type="checkbox"/> 100 000\$ - 119 999\$ |
| <input type="checkbox"/> 40 000\$ - 49 999\$ | <input type="checkbox"/> 120 000\$ - 149 999\$ |
| <input type="checkbox"/> 50 000\$ - 59 999\$ | <input type="checkbox"/> 150 000\$ or more |
| <input type="checkbox"/> 60 000\$ - 69 999\$ | <input type="checkbox"/> Don't know |

109. Please complete this chart about your residential history beginning with where you currently live and working back to where you last lived in high school (13-14 years ago).

		Number and Street	City	Number of years lived at this address (if less than 12, write LT12)
1	Current address			
2	Address prior to 1			
3	Address prior to 2			
4	Address prior to 3			
5	Address prior to 4			
6	Address prior to 5			

110. To help us locate you for the next follow-up, what is your....?

Home telephone number _____
 Cell phone number _____
 E-mail address _____

Comments for us:

**END OF QUESTIONS
 THANK YOU SO MUCH FOR RESPONDING!**

APPENDIX B Ethics Approval



Comité d'éthique de la recherche du CHUM
Pavillon R, 900 rue St-Denis, 3^e étage
Montréal (Québec) H2X 0A9

Formulaire de demande de renouvellement annuel de l'approbation d'un projet de recherche

Date de dépôt du formulaire : 2020-11-18 08:42
Date d'approbation du projet par le CER : 2007-02-21
Numéro(s) de projet : 2007-2384, ND 06.087 - MJB
Statut du formulaire : Approuvé

Déposé par : Riglia, Teodora
Identifiant Nagano : ND 06.087
Formulaire : F9-59408

Suivi du BCER

1. **Statut de la demande:**
Demande approuvée

2. **La demande a été traitée par :**
Lynda Ferlatte
date de traitement:
2020-12-03

3. **Renouvellement accordé**
du 27 novembre 2020 au 27 novembre 2021

Déviations en cas de retard de renouvellement

1. **Veillez cliquer sur la case ci-dessous afin de confirmer que vous avez bien lu cette information.**

Veillez noter qu'il est obligatoire de soumettre un formulaire F16 (Formulaire de déviation éthique/retard rapport annuel (F9)), lorsque votre demande de renouvellement est déposée après l'expiration de l'approbation/réapprobation annuelle de votre projet.

J'ai lu l'information

Section 1 - Renseignements généraux

1. **Indiquez, en français, le titre complet du projet de recherche**

L'étude de la dépendance à la nicotine

2. **Indiquez le nom du chercheur responsable local (CHUM)**

O'loughlin, Jennifer

3. **Est-ce que le formulaire et/ou documents soumis au CER doivent être vus en réunion plénière (Full Board) selon les exigences des organismes subventionnaires (NIH, RTOG, NCIC, etc.)**

Non

4. **Indiquez le statut actuel du projet de recherche**

Projet en cours dont le recrutement est terminé

Section 2 - Projet de recherche

1. **Date à laquelle le projet de recherche a commencé:**

2007-02-21

2. **Date à laquelle le projet de recherche devait se terminer initialement (lors du dépôt initial du projet, pour un PREMIER RENOUVELLEMENT) ou date de fin inscrite dans le dernier renouvellement demandé.**

2020-10-31

Votre date de fin de projet inscrite ci-dessus est-elle antérieure au renouvellement annuel demandé aujourd'hui ?

Oui

Si oui, veuillez inscrire ci-dessous, la date d'extension demandée correspondant au renouvellement soumis aujourd'hui.

2021-10-31

3. **Quel est le profil des participants de recherche?**

Quel est le sexe des participants à la recherche?

- Hommes
- Femmes
- Autres

Quel est le niveau d'aptitude des participants à la recherche?

- Majeurs aptes
- Majeurs inaptes
- Mineurs
- Majeurs, mais dont l'inaptitude est subite

Informations complémentaires des participants à la recherche?

- Membres du personnel de l'établissement
- Personnes recrutées dans un groupe témoin
- Personnes hospitalisées
- Personnes vues en consultation (consultation externe, clinique privée, hôpital de jour, etc.)
- Personnes qui se présentent à l'urgence de l'établissement
- Personnes proches des sujets
- Personnes touchées par un programme ciblé (précisez)
- Autre, spécifiez

Précisions complémentaires

Participants population générale (écoles secondaires Montréal 1999)

Section 3 - "Essai clinique ou autre projet recrutant des participants humains"

1. **Es-ce que votre projet est un essai clinique ou autre type de projet recrutant des participants humains?**

Oui

Précisez quel est le type de projet recrutant des participants humains (ex.: essai clinique, recherche fondamentale etc.)

Recherche épidémiologique

Veillez inscrire le nombre de participants initiaux à recruter :

1293

Veillez inscrire le nombre de participants qui ont effectivement été recrutés :

1208

Nombre de participants dont la participation n'est pas terminée (suivi en cours) :

1033

Nombre de participants dont la participation est terminée :

175

Nombre de participants ayant abandonné l'étude (retrait volontaire) :

175

Donnez-en la raison :

non connue

Nombre de participants exclus ou retirés du projet :

155

Donnez-en la raison :

non connue

Section 4 - "Recherche sur dossiers"

1. **Es-ce que votre projet est une RECHERCHE SUR DOSSIERS ?**

Non

Section 5 - "Banque d'échantillons/base de données/recherche fondamentale"

1. **Es-ce que votre projet est une banque d'échantillons/base de données/recherche fondamentale?**

Non

Section 6 - Informations autres centres

1. *S'agit-il d'un projet multicentrique dans le RSSS au Québec?*

Non

Section 7 - Dernière année

1. **Au cours de la dernière année et par rapport à la situation au moment de la dernière approbation du CÉR :**

Avez-vous rapporté tous les effets indésirables graves au Comité d'éthique depuis la dernière approbation du CÉR ?

- OUI
 NON
 N/A

Avez-vous rapporté tous les changements ou amendements (protocole, formulaire de consentement, etc.) depuis la dernière approbation du CÉR ?

- OUI
 NON
 N/A

Signature

1. **J'atteste que les renseignements fournis dans le présent formulaire sont exacts.**

Nom et prénom de la personne qui a complété ce formulaire

Teodora Ringlea