MIND IN MOTION: EVALUATION OF AN EXERCISE PROGRAM FOR POST-SECONDARY STUDENTS WITH DEPRESSION

by

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B.A. Kinesiology, The University of Western Ontario, 2019

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

(Kinesiology)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

October 2024

The following individuals certify that they have read, and recommend to the Faculty of Graduate and Postdoctoral Studies for acceptance, the thesis entitled:

Mind in Motion: Evaluation of an exercise program for post-secondary students with depression.

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submitted by Cassandra Kell-Cattrysse in partial fulfilment of the requirements for

the degree of Master of Arts

in Kinesiology

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Abstract

Post-secondary student mental health is a serious concern with up to 70% of students reporting depressive symptoms. Exercise could be an effective treatment alternative to address the demand for support on campus and extended wait times to receive care. However, there is limited evidence on how to integrate exercise referral pathways into mental health care particularly in post-secondary settings. Drawing on the Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM) framework, the objective of this research was to conduct a program evaluation of Mind in Motion (MIM), an on-campus evidence-based exercise referral program for post-secondary students with depression. MIM is a 6-week exercise program with personal training delivered in collaboration with mental health services. Participants recruited for this evaluation include post-secondary students (SPs) referred to MIM, exercise professionals (EPs), and referring mental health providers (CS staff). In a single-arm pre-post pilot study, mixed-methods data were collected including self-report symptom questionnaires, attendance records, and semi-structured interviews with SPs (N:8), EPs (N:5), and CS (N:5) staff at the intervention's conclusion. Pre-post self-report symptom changes for student participants were positive with improvements in symptoms of depression (PHQ-9 scores decreasing from 10.6 (n=16) to 5.27 (n=11)), anxiety (GAD-7 scores decreasing 10.13 (n=16) to 6.09 (n=11)), and overall wellbeing (FS increased from 37.94 (n=16) to 43 (n=11)). Self-reported weekly minutes of MVPA (IPAQ-SF) increased from 82.86 (n=14) at baseline to 246 minutes (n=10) post program. However, reach was limited due to low adoption rates of CS staff making referrals. Despite this, MIM participation was associated with improvements in students' mental health outcomes and all program partners see value in the long-term maintenance of MIM on campus. Future implementation of MIM should: 1) expand reach through further training of CS staff and

by adding additional referral pathways to MIM, 2) shift to group exercise sessions, and 3) include further training of EPs to support SP behaviour change. The results of this evaluation will be used to inform future iterations of MIM while adding to the emerging literature on developing referral pathways between mental health practitioners and EPs for individuals seeking treatment for depression.

Lay Summary

Exercise could be an effective treatment option for depression. Mind in Motion is an exercise-based treatment program for students with clinically significant depressive symptoms at the University of British Columbia. The purpose of this thesis was to conduct a program evaluation investigating the effectiveness and implementation of Mind in Motion. This evaluation found that participating in the program was associated with improvements in students' mental health and physical activity levels at post-program and 6-weeks post-program. However, enrollment rates were low with the referral strategy limiting the number of students who could access this treatment option. Interviews with the student participants, exercise professionals, and referral agents indicated that while the adoption of the referral process was limited, the exercise program was implemented as intended. The results may be used to inform future iterations of Mind in Motion while contributing to the limited literature on implementing exercise-based treatments for depression.

Preface

This thesis includes one original study, with no publications submitted to date. The following manuscript is the original, unpublished work by Cassandra Kell-Cattrysse. Cassandra was responsible for all major areas of this program evaluation including data collection, analysis, and preparation of this document. As well, Cassandra co-led the design and implementation of MIM with the Population Physical Activity Lab. Dr. Guy Faulkner co-lead the design of this study protocol, provided guidance throughout data analysis, and approved the final written document of this thesis. Committee members Dr. Andrea Bundon and Dr. Jasmin Ma provided guidance and feedback on the study design and written document. Lastly, Dr. Madelaine Gierc was a co-lead in the implementation of MIM and provided guidance and feedback on the study protocol and analysis processes.

The results of this evaluation came from MIM, a collaboration between the Population Physical-Activity Lab (Pop-PA lab) at the University of British Columbia, on-campus Counselling Services, and an on-campus gym facility, BodyWorks. MIM was funded by Campus as a Living Lab from 2023-2024. Ethics approval was granted by the University of British Columbia (RISe) (Ethics ID #: H17-02498-A011).

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List of Abbreviations

BCT	Behaviour Change Techniques
CANMAT	Canadian Network for Mood and Anxiety Treatments
CSEP	Canadian Society of Exercise Physiology
CS	Counselling Services
DSM-IV	The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
EMR	Electronic Medical Record
EPs	Exercise Professionals
FS	Flourishing Scale
GAD-7	Generalized Anxiety Disorder Scale
IPAQ-SF	International Physical Activity Questionnaire- Short Form
MDD	Major Depressive Disorder
MIM	Mind in Motion
PA	Physical Activity
PHQ-9	Patient Health Questionnaire
POP-PA	Population Physical Activity Lab
RE-AIM	Reach, Effectiveness, Adoption, Implementation, Maintenance
SDT	Self Determination Theory
SPs	Student Participants
TMF	Theories, Models, and Frameworks
UBC	University of British Columbia
WHO	World Health Organization

Acknowledgements

- Supervisor: Guy, thank you for the ongoing support and guidance throughout the last two years. Beyond this, thank you for creating the cohesive and supportive environment that we have in the Pop-PA lab. Your efforts and encouragement to bring the lab together will always be the moments that I look back on the most from this degree- from curling events to puzzles at the conference table, and Storm the Wall or Day of the Longboat… Thank you!
- Committee: To my committee, Jasmin and Andrea, thank you for supporting and helping to guide my research process throughout the last year.
- Lab mates in the Pop-PA lab: Thank you for the laughs, friendship, coffee breaks, support, and guidance. This degree wouldn't have been possible without each of you!
- Program partners: Thank you to the BodyWorks and UBC Counselling Services staff for being excited about Mind in Motion and for learning along the way, with us at the lab, on how best to implement this program.
- Grant support: Gratitude for the CLL fund in funding Mind in Motion and making this rewarding thesis project possible.
- My friends across the world: thank you for the support that continues despite time and distance apart.
- My friends in Vancouver: who became my family… I'm grateful beyond words for each of you!
- My parents: Thank you for encouraging and supporting every new thing I set my mind to… even if it means moving across the country!

Dedication

To Wanda Needham for creating the space where I fell in love with dance,

Jacki Dunlop for teaching me how to safely engage in exercise,

and Barb Sarma for reframing my narrative for movement.

"I think the biggest thing for me was instead of exercising for how I looked, like trying to look a certain way… the environment helped me kind of reframe my mindset towards exercise. I look at it now more so as a thing that benefits my overall well-being and it's not something I'm like, trying to, you know, fit into a size two dress or whatever. It's more so like, I'm wanting to get stronger. I'm excited to run further a bit faster. It's a healthier relationship to exercise and to my body" (SP2)

Chapter 1: Introduction

Depression often develops in adolescence and early adulthood at a time when many individuals transition out of high-school and onto further education (Yates et al., 2020). Post-secondary student mental health in Canada is a serious concern with up to 70% of students reporting depressive symptoms (American College Health Association, 2022). Student's mental health impacts their academic success and their ability to participate in all aspects of their life fully and meaningfully (Canadian Association of College & University Student Services and Canadian Mental Health Association, 2013). There is an urgent demand in post-secondary institutions to foster an environment which supports mental health and well-being (DeJonge et al., 2021).

To address the large demand on post-secondary student mental health services, it has been suggested to take a systemic approach by implementing programs at the population level (Canadian Association of College & University Student Services and Canadian Mental Health Association, 2013). Systemic strategies address the whole campus, provide an environment for students to flourish, prioritize social equity and sustainability, provide targeted programs and services for students who need them, and are developed with the involvement of student voices and partners' perspective (Canadian Association of College & University Student Services and Canadian Mental Health Association, 2013).

Depression is often treated through antidepressants and/or psychotherapy (Ravindran et al., 2016). However, exercise has been shown to be equally as effective as pharmacology or psychotherapy for mild-to-moderate cases of depression and can be used as an accessible and evidence driven alternative to treat this mental health condition (Lee et al., 2021; Ravindran et al., 2016). Holistic well-being initiatives and exercise treatment interventions which target

student mental health may be an effective systemic strategy to combat long wait-times for psychiatric treatment (DeJonge et al., 2021) and can provide an additional treatment option for students who need targeted services.

Post-secondary students have viewed exercise as a valuable tool for self-care and to improve symptoms of depression (DeJonge et al., 2020). University campuses offer a unique environment which house both Counselling Services and exercise facilities, providing the ability to implement exercise programs and the related referral processes in an integrated setting. With an urgent need for more mental health supports on university campuses, exercise interventions may be an evidence based, cost-effective way to assist the over-burdened health systems on campus (DeJonge et al., 2021). However, there is limited evidence on how to integrate exercise referral pathways into mental health care (Yates et al., 2020; Baura et al., 2021; Schmitter et al., 2020). In this thesis I present a program evaluation which explores the effectiveness and implementation of an on-campus evidence-based exercise referral program, Mind in Motion (MIM), for post-secondary students with depression. The RE-AIM framework was used for evaluation as it emphasises ecological validity (RE-AIM, 2023; Biddle et al., 2021). It is designed to give special attention to essential elements which make programs sustainable, adoptable, effective, and evidence-based (RE-AIM, 2023). Using mixed methodology, I explore whether an exercise intervention can be an acceptable, effective, and sustainable intervention that could be implemented and integrated into stepped care approaches supporting student mental health.

Chapter 2: Literature Review

This literature review begins with an exploration of the literature and theories which guide my research. I start with an overview of depression, anxiety, and the prevalence of these mental health concerns in my sample demographic of post-secondary students. This is followed by a review of the current literature on exercise-based treatments for post-secondary students. I conclude by identifying the gaps in the existing body of research and how I address these in my research project. Lastly, I present my research questions.

2.1 Depression

Mental health encompasses emotional and psychosocial well-being (McFadden et al., 2022). The World Health Organization (WHO) defines mental health as "a state of well-being in which the individual realizes his or her own ability, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (WHO; 2005, p.2). The prevalence of poor mental health is alarming with approximately 50% of people experiencing a mental health disorder within their lifetime (Singh et al., 2023; McFadden et al., 2022). With high rates of poor mental health, the WHO emphasizes that it is essential to promote, protect, and restore individuals' mental health as it is related to our ability to enjoy life, earn a living, think, feel, and interact with others in society (WHO; 2005).

Major Depressive Disorder (MDD) is a chronic mental health condition clinically characterized by a decreased interest in activities and/or depressive mood for two weeks or more, along with at least four key presenting features such as emotional symptoms (e.g., low mood and anhedonia), and neurocognitive symptoms (e.g., fatigue, difficulty concentrating, changes in eating habits, suicidal thoughts, sleeping disturbances) (DSM-IV, American Psychiatric Association, 1994). These symptoms can interfere with the ability to perform daily tasks and can

impede successful transitioning through stages of life. As a chronic condition, depressive disorders are one of the leading factors of years lived with a disability (James et al., 2018). Along with that, depression creates a large global economic burden, is associated with a decreased quality of life, impacts psychosocial functioning, and is associated with co-morbidities and overall mortality (Singh et al., 2023; Cody et al., 2022). Depression is often associated as a co-morbidity with physical health conditions such as diabetes and arthritis (Josefsson et al., 2014), as well as other mental health conditions, such as generalized anxiety disorder and substance use disorders (Thapar et al., 2012). The development of mental illness, such as depression and/or anxiety, seems to be greatest in young adults resulting in negative short-term outcomes (e.g., increased fatigue, loneliness, and problems concentrating) and long-term chronic health outcomes (e.g., relationship troubles, difficulty securing a job, and persistent emotional and physical health symptoms) (Jeftic et al., 2023).

2.2 Post-Secondary Students and Depression

MDD often develops in adolescence and early adulthood at a time when many individuals transition out of high-school and onto further education (Yates et al., 2020). Many young adults enroll into post-secondary education during this developmental period when the prevalence of mental health difficulties increases (Jeftic et al., 2023). Student's mental health is essential to their academic success and their ability to participate in all aspects of their life fully and meaningfully (Canadian Association of College & University Student Services and Canadian Mental Health Association, 2013). A recent national Canadian survey reported post-secondary student mental health as a serious concern with high rates of students reporting poor mental health including: 59% reporting symptoms of loneliness, 52% reporting moderate psychological distress, 33% reporting severe psychological distress, and 3% of students indicating they had

attempted suicide within the last 12 months (American College Health Association, 2022). Within this survey, 25% of students reported having ever been diagnosed with a depressive disorder and 32% reported having ever been diagnosed with an anxiety disorder (American College Health Association, 2022). Post-secondary students are especially vulnerable to developing mental illness due to risk factors such as substance use (binge drinking and marijuana use), lack of physical activity, financial stress, sleep problems, poor school-life balance, ineffective coping strategies, a transitioning stage of life, and being in a high stress environment (Jeftic et al, 2023; McFadden et al., 2023). As a result, students' academic performance can decline and the overall student experience may be impacted through social isolation, disengagement, difficulty with relationships, poor class attendance, poor grades, and decreased graduation rates (Jeftic et al., 2023).

Unfortunately, average wait times to receive non-urgent (i.e., no threat of harm to self or others) psychiatric treatment in Canada may be as high as 22 weeks, which equates to longer than one academic semester for post-secondary students (Barua et al., 2021). There is an increasing demand for post-secondary institutions to provide an environment which supports mental well-being. Further, there is a need for accessible and evidence driven programs on campuses to support post-secondary students who may experience long wait times to receive mental health care. Systemic strategies such as holistic well-being initiatives and programs may be an effective way to combat long wait-times for psychiatric treatment and reduce the burden on campuses for mental health treatment (DeJonge et al., 2021; Canadian Association of College & University Student Services and Canadian Mental Health Association, 2013). One treatment option to support student mental health and decrease lengthy wait lists for consultation with mental health practitioners may be evidence-based exercise interventions (Jeftic et al., 2023).

2.3 Exercise-Based Treatment for Depression

MDD is often treated through antidepressants and/or psychotherapy (Ravindran et al., 2016). However, exercise has been shown to be equally as effective as pharmacology or psychotherapy for mild-to-moderate cases of depression and is now recommended as a front-line monotherapy by the *Canadian Network for Mood and Anxiety Treatments* (CANMAT) (Ravindran et al., 2016). Exercise may be right for depressive patients if they have low mood, mild-to moderate depression, concerns with the side effects of medication, or if psychotherapy is not easily accessible (Glowacki & Faulkner, N.D.; Heissel et al., 2023). The current CANMAT guidelines recommend an exercise prescription of a minimum of 30 minutes of moderate-to-vigorous exercise, three times a week, for at least nine weeks, and supervised if possible (Ravindran et al., 2016).

2.3.1 Why Exercise?

There are several reasons why exercise may be an attractive treatment option for individuals with depression. As mentioned, depression is often treated with psychotherapy or antidepressant medication (Ravindran et al., 2016). However, psychotherapy is not always available with long wait times to receive care and no public health care coverage in Canada (Barua et al., 2021). High costs and delayed treatment admission can prevent health seeking behaviour or result in a worsening of symptoms over time and increasing the risk of developing comorbidities (Heissel et al., 2023). Even if available and financially feasible, psychotherapy remission rates fall around 50% (Heissel et al., 2023). Medication can be a more time-efficient treatment option, and more accessible for Canadians with prescription drug coverage. However, antidepressants are associated with adverse side effects such as weight gain, increased risk of suicide, and increased

blood pressure (Cooney et al., 2013; Heissel et al., 2023; Hetrick et al., 2012). These side effects may prevent adherence and/or acceptance of this treatment method (Keeler et al., 2021).

Exercise serves as a cost-effective and timely treatment option. Exercise opportunities are readily available and can be done at no cost when self-guided, or for a minimal cost at local fitness facilities. This could significantly decrease the financial burden placed on health care costs through using an alternative treatment for depression (Singh et al., 2023). Physical activity and exercise interventions are viewed as a more holistic approach to treat and manage mental health concerns through building competency in self-care, stress-reduction, and wellbeing strategies (DeJonge et al., 2021, Jeftic et al., 2023). Exercise may also be a less stigmatizing option than medication or psychotherapy to those who are hesitant to seek health care or to adhere to other treatments for depression (Heissel et al., 2023). Unlike medication, exercise participation results in no serious side effects aside from worsening of pre-existing orthopedic injuries or rare adverse events (Heissel et al., 2023). Additionally, exercise interventions can decrease the risk of comorbidities and improve overall quality of life through improvements in blood pressure, bone density, body composition, cardiovascular function, and sleep quality (Yates et al., 2020; Cody et al., 2022; Heissel et al., 2023).

2.3.2 Mechanisms

Mechanisms which explain how exercise benefits mental health are not clearly known. However, the etiology of most mental disorders results from the influence, and combination of genetic (i.e., biological) and environmental factors (i.e., psychosocial, cultural, behavioral) (Clarke et al., 2017). Therefore, it is likely that the benefits of exercise stem from a combination of changes in psychological, neurophysiological, and social mechanisms (Singh et al., 2023).

Overall, exercise has benefits on psychosocial outcomes such as improved quality of life and daily functioning, as well as neurocognitive benefits such as improvements in working memory and attention (Lee et al., 2021). The psychosocial hypothesis for exercise and mental health is supported by several theoretical frameworks including self-determination theory (SDT) (Ryan & Deci, 2017). SDT focuses on human needs and motivation, stating that people have three primary psychological needs: 1) the need to feel in control of their own behaviour and goals (autonomy), 2) the need to have a sense of confidence in their skills/ abilities (competency), and 3) the need for a sense of belonging and connection with others (relatedness) (Ryan & Deci, 2017). Individuals with depression can be supported through autonomy, competency, and relatedness to improve mental health symptoms through an exercise program (Jeftic et al., 2023; Keeler et al., 2021). For example, by building a sense of control over their own health, boosting confidence, and fostering connection through exercising with others. These three elements of the SDT may be important especially for post-secondary students with depression. It has been reported that post-secondary students view exercise as a valuable self-help, and stress-reduction, strategy (DeJonge et al., 2021). For students, the impact of exercise on their mental health includes improvement in symptoms of anxiety, decreased stress, increased social interaction, improved confidence, and in some cases, more exposure to campus climate and a greater sense of belonging (Jeftic et al., 2023). SDT is one example of a psychosocial theory explaining how exercise may function to improve mental health. Further research is needed to fully understand the psychological, neurophysiological, and social mechanisms on exercise's effect on mental health.

2.4 Evidence for Exercise

Any bodily movement by the skeletal muscles which results in energy expenditure is considered physical activity (Caspersen et al., 1985). Structured, planned, and purposeful (for improving or maintaining physical fitness) physical activity is considered exercise (Caspersen et al., 1985). As mentioned, exercise is recognized as a front-line monotherapy for mild-moderate depression, and as an adjunctive treatment for moderate-severe depression by the CANMAT (Ravindran et al., 2016). Exercise programs have repeatedly been shown to significantly improve depressive symptoms in systematic reviews with two large-scale systematic reviews published in 2023 recognizing exercise to be beneficial for reducing symptoms of depression, and anxiety (Heissel et al., 2023; Singh et al., 2023).

Singh et al. (2023) conducted a systematic review of meta-analyses to synthesize current evidence for physical activity and its effects on symptoms of depression, anxiety, and psychological distress in adults (Singh et al., 2023). The authors selected ninety-seven meta-analyses including randomized control trials with PA interventions designed to improve depression, anxiety and/or psychological distress through an increase in PA (Singh et al., 2023). PA was concluded to be highly beneficial for general adult populations, and people diagnosed with mental health disorders and chronic diseases in improving symptoms of depression, anxiety, and psychological distress (Singh et al., 2023). The greatest benefits were shown for high intensity PA, although all modes of PA included in this review were effective (Singh et al., 2023). Medium effect sizes were shown for PA compared with usual treatment options for depression, anxiety, and psychological distress (median effect size range= -0.42 to -0.60) (Singh et al., 2023). Long-term interventions were not seen to be necessary for therapeutic benefits (Singh et al., 2023) which may present as another benefit of short-term exercise interventions

compared to psychotherapy or medication which often have longer prescription durations. More research is needed to understand the effectiveness of PA interventions in combination with other treatments for depression (Singh et al., 2023).

Similarly, Heissel et al. (2023) conducted a systematic review and meta-analysis looking at the effect of exercise on MDD (Heissel et al., 2023). The authors synthesized 41 studies including 2264 participants, all of which demonstrated a large effect for exercise compared to control conditions (Heissel et al., 2023). The effect from the exercise intervention remained positive regardless of sample size, group setting, exercise modality, depressive disorder, and risk of bias (Heissel et al., 2023). Notably, aerobic or resistance training interventions had a larger effect than interventions which combined aerobic and strength training together, with stronger evidence for moderate intensity training (Heissel et al., 2023). The authors note that high heterogeneity in methods and small sample sizes should be considered when reviewing these results, and that more long-term follow ups are needed to understand current gaps in the literature (Heissel et al., 2023). Overall, this review concludes that exercise is effective in treating depression and should be offered as a treatment option in line with other current first line treatments (medication and/ or psychotherapy), particularly in a supervised or group exercise setting, moderate intensity, and aerobic exercise training over other modalities (Heissel et al., 2023).

Efficacy trials focus on whether an intervention works under ideal conditions while effectiveness trials focus on whether a trial works in real world settings (Lawrence et al., 2023). Overall, meta-analytic evidence consistently demonstrates the *efficacy* of exercise as a treatment for depression. Perhaps less substantive is evidence for the *effectiveness* of exercise interventions in the real world, which is the focus of my research.

2.4.1 Evidence for Exercise in a Post-Secondary Setting

Exercise has been shown to support the mental health and overall lifestyle of postsecondary students (Jeftic et al., 2023). However, there are no current systematic reviews synthesizing the present data on the effectiveness or efficacy of exercise interventions for depression and/or anxiety in a post-secondary setting. Exercise programs targeted at post-secondary mental health are limited, however those that are published demonstrate the feasibility and effectiveness of these mental health supports (Jeftic et al., 2023).

DeJonge et al. (2021) explored the effectiveness and acceptability of a physical activity program for post-secondary student mental health at the University of Toronto (DeJonge at al., 2023). The intervention was a 6-week, supervised exercise program with one, hour long session per week which included thirty minutes of PA behaviour change coaching, and thirty minutes of PA at an intensity selected by the participant (DeJonge et al., 2021; Jeftic et al., 2023). Students seeking mental health support on campus were recruited for the program through a referral of an on campus mental health practitioner, or through students self-referring through viewing posters posted in the waiting room of on campus mental health centers (DeJonge et al., 2021). One to two additional self-guided PA sessions were encouraged per week, with a target of 150 minutes total of activity per week (DeJonge et al., 2021). The study used a pretest-posttest design, with student participants (SP) completing self-report symptom questionnaires to measure symptom outcomes, and semi-structured interviews to explore student perspectives on program acceptability (DeJonge et al., 2021). This feasibility study found a significant reduction in symptoms of distress, anxiety, and depression post program (DeJonge et al., 2021). SPs reported the program to be an effective and acceptable approach to mental health treatment on campus (DeJonge et al., 2021). Additionally, future research was suggested to take a theory informed

approach as students related the acceptability of the program to feelings of autonomy, competency, and relatedness (DeJonge et al., 2021).

Regarding the acceptability of exercise as a treatment for depression, there is limited evidence which goes beyond the patient's perspective in qualitative interviews (Searle et al., 2011). A physical activity counselling (PAC) program for post-secondary students was developed by McFadden et al., (2022) to target low levels of PA and improve mental health symptoms on a university campus (McFadden et al., 2022). The authors used a mixed methods design to explore the implementation, acceptability, and impact of this program on campus (McFadden et al., 2022). The intervention consisted of kinesiologists with specific training in motivational interviewing and behaviour change techniques working as the physical activity counsellors (PAC). These PACs talked with students bi-weekly to check in on the students PA behaviour and to develop and encourage strategies to continue to increase overall PA to benefit mental health (McFadden et al., 2022). Quantitative data was collected from students using self-report symptom questionnaires while qualitative data was collected from PACs through semi-structured interviews. Students reported increases in PA and improved mental health symptoms surrounding emotional, social, and psychological well-being (McFadden et al., 2022). The PAC's reported that the program was a good learning experience for kinesiologists, and that it was important to build trusting relationships with SPs during the intervention using behaviour change techniques (e.g., supporting change, emphasizing autonomy) (McFadden et al., 2022). Although this intervention did not involve a structured and supervised exercise program, it is one of the first interventions which explored the voices of practitioners who delivered the program to understand a different perspective on program acceptability and impact on campus.

In a review paper by Jeftic et al., (2023), the authors synthesized important considerations to inform the development and implementation of exercise programs in higher education institutions to support student mental health treatment (Jeftic et al., 2023). Four broad considerations and themes are reported for the development, delivery, and evaluation of evidence-based exercise programs (Jeftic et al., 2023). Firstly, an exercise program should have elements that support students' engagement in the program and behaviour change such as using trained peer mentors, and implementing motivationally supportive strategies (Jeftic et al., 2023). Second, considering the dose of exercise is important. This review suggests a dose of 30-60 minutes per bout of exercise, with multiple sessions per week, for 6-10 weeks, and a measurement of mental and physical health program outcomes (Jeftic et al., 2023). Third, adopting a whole campus approach in the design and delivery of the program to ensure engagement of key on-campus end-users such as students, medical staff, research experts, etc. (Jeftic et al., 2023). Lastly, considering process evaluations, integrating comprehensive feasibility studies, ecological momentary assessments, and using qualitative and quantitative designs are key methodological considerations when designing and evaluating the implementation of a program of this kind (Jeftic et al., 2023).

The benefits of exercise on depression have been studied extensively in the field of sport and exercise science and has been proven to be efficacious in reducing depressive symptoms (Heissel et al., 2023). Yet, there is limited evidence on how to integrate exercise referral pathways into specific mental health care contexts (e.g., community-based referral strategies, adolescent, and youth programs, etc.) (Yates et al., 2020; Baura et al., 2021; Schmitter et al., 2020). Further, there is limited evidence on how to integrate exercise referral pathways into post-secondary mental health care, along with limited insight regarding the acceptability and effectiveness of this

treatment option (Yates et al., 2020; Baura et al., 2021; Schmitter et al., 2020; DeJonge et al., 2021). Understanding the values and attitudes of those involved in exercise interventions on campus, including practitioners and patients, can help to make sense of intervention outcomes such as symptom improvements, program adherence, and program uptake (DeJonge et al., 2021).

2.5 Rationale

Despite extensive evidence and adoption into clinical guidelines in Canada, exercise interventions have not been widely implemented in mental health care. This may be the result of multiple factors including patient resistance and difficulty prescribing, referring, and monitoring exercise in clinical practices (Singh et al., 2023). Mental health practitioners need to be informed on the benefits of exercise as an alternative treatment for mild-to-moderate depression and understand how to develop referral pathways in their own practice to EPs. For exercise treatments for depression to be widely disseminated, EPs themselves need to understand common patient experiences to design effective interventions which are targeted towards their patients' needs. Additionally, EPs need to develop their own mental health literacy and vocabulary in practice which is targeted towards their patient's mental health condition (Stanton, 2018).

A lack of ecological validity is one of the main limitations on evidence regarding the implementation of exercise-based treatments for depression (Yates et al., 2020; Schmitter et al., 2020). Post-secondary campuses provide an optimal environment to address these issues and implement exercise-based interventions for mental health in a real-world context, as there is already established infrastructure including mental health counselling services, exercise facilities and access to qualified EPs. In my research project, the RE-AIM framework was used to evaluate an exercise-based treatment for depression which was implemented within the ideal

environment of a university campus. RE-AIM is designed to give special attention to essential elements which make programs sustainable, adoptable, effective, and evidence-based (RE-AIM, 2023). This framework was chosen to measure the effects of the intervention from multiple levels while also exploring the barriers and facilitators to its implementation in real-world settings (Bird et al., 2019), therefore emphasizing ecological validity (RE-AIM, 2023).

2.6 Research Questions

The purpose of my research was to conduct a program evaluation investigating the effectiveness and implementation of an on-campus evidence-based exercise referral program, MIM, for post-secondary students with MDD. Using self-report symptom questionnaires and semi-structured interviews, this research aimed to measure SP symptom outcomes and understand the experiences in implementing this exercise program according to (1) post-secondary students with depression after completing an on-campus exercise treatment intervention, (2) the EPs delivering the program, and (3) the mental health counsellors who are responsible for referring students to the program. I address the following research questions:

1. What was the reach of MIM?
2. Was the program effective at improving student mental health?
3. Was MIM adopted on campus by referral agents?
4. What are the barriers and facilitators to the implementation of this exercise-based program?
5. To what extent can MIM be maintained on campus? What are the implications towards the sustainability of this treatment option on campus?

Research involving the voices of end-users in exercise programs and referral pathways for the treatment of depression is needed to build upon current literature and expand our

understanding of what effective and sustainable exercise programs and referrals look like (Searle et al., 2011, Jeftic et al., 2023). While directly informing future iterations of a UBC initiative, this research may also inform service providers in other jurisdictions in developing referral pathways between mental health practitioners and EPs for students seeking treatment for depression.

Chapter 3: Mind in Motion

Mind in Motion (MIM) is a supervised exercise program where students are referred to an EP at the BodyWorks gym located on UBC campus. Participation in the program is free with the referral of a mental health counsellor at UBC. MIM was initially designed and delivered in 2017. It was developed after formative research with UBC undergraduates and initially based on a campus physical activity program for post-secondary student mental health delivered at the University of Toronto (DeJonge et al., 2021). During the COVID-19 pandemic, MIM shifted to run online via zoom, then eventually was put on hold. With new funding, the first wave of this exercise treatment program was implemented during the September 2023-April 2024 academic school year with a maximum capacity of 50 students, 25 per school term.

MIM is a collaboration between the Population Physical-Activity Lab (Pop-PA lab), on-campus Counselling services, and an on-campus gym facility, BodyWorks. The Pop-PA lab was responsible for the development of this referral pathway, for facilitating communication between Counselling Services and BodyWorks, and for conducting a program evaluation. UBC Counselling Services were responsible for the identification of students with depressive symptoms. After screening, they referred eligible students to Bodyworks to begin the enrollment process into MIM. BodyWorks was then responsible for the assessment of exercise safety and eligibility, enrolment, and for designing and delivering the 6-week exercise-based treatment. The Pop-PA lab, Counselling Services, and BodyWorks are further referred to as MIM program partners in this document.

UBC Counselling Services operates using a stepped care system which provides treatment options that can be stepped up or down based on the student's progress and includes a collaborative and integrated approach across health care providers and varying treatment options

("Collaborative stepped care," 2022). Within a stepped care model, the intensity of treatment interventions chosen should match the level of care needed for the individual (Cross & Hickie, 2017). The intensity of a treatment option can be defined by the number of professionals involved, financial cost, frequency of treatments, length and duration of the prescribed care, and amount of required physical attendance of the individual (Cross & Hickie, 2017). MIM was designed to be appropriate for people experiencing a range of depressive symptoms and could be applied in the future across the UBC Counselling Services stepped care model from early steps and preventative treatments (early intervention option using exercise as a self-directed, self-care strategy), as a monotherapy for mild to moderate depression, and as an adjunctive treatment for moderate-severe cases of depression. At its current stage of implementation, MIM was designed to provide an additional low-intensity treatment option within the stepped care model for mild-moderate cases of depression. This program aimed to support students with mild to moderate depression on UBC campus through 1) providing free supervised exercise program, 2) offering a risk-free treatment option, 3) supporting patient-centered care and providing holistic treatment alternatives (DeJonge et al., 2021), 4) reducing wait times to receive mental health care, 5) providing a treatment option with consideration of co-morbidities such as anxiety, and/or physical health conditions (Cross & Hickie, 2017), 6) and providing exercise treatment which is non-stigmatizing compared to conventional mental health treatments (Stanton, 2018; DeJonge et al., 2021).

3.1 Program Overview

This intervention is grounded in research and clinical guidelines which recommend exercise as an effective stand-alone treatment for mild-to-moderate depression (Ravindran et al., 2016), with a focus on empowering students and teaching them strategies for independent, self-

managed exercise and depressive symptom management. The program itself involves a 6-week intervention including two, hour-long sessions per week. Students were paired with an EP at BodyWorks. All EPs were current upper year (3rd or 4th year) undergraduate kinesiology students at UBC, have completed, or were in the process of completing their certified personal training certification with the Canadian Society of Exercise Physiology (CSEP), completed a 10-hour module on exercise and mental health (CSEP), and were supervised by a CSEP Exercise Physiologist. Sessions typically had 1-4 participants exercising at one time under the guidance of one EP. Exercise programming was individualized, including a combination of cardiovascular and strength training based on the students' preferences, fitness assessment, and abilities. EPs encouraged one additional exercise session per week to be done at home. This program was designed to match the CANMAT guidelines for exercise and depression with three structured and supervised exercise sessions per week, for at least 30 minutes per session (Ravindran et al., 2016), but with one of those sessions to be completed without supervision. The intervention was also broadly informed by Self-Determination Theory (SDT) which emphasizes building autonomy, competence, and relatedness (Ryan & Deci, 2017).

3.1.1 Program Protocol

Students move through a six-step process in MIM.

1. Students experiencing depressive symptoms present to UBC Counselling Services on campus. A counsellor helps direct the student to the best course of treatment. A waitlist for Counselling Services (talk therapy) is typically offered along with various other treatment options, including MIM.
2. MIM can be discussed with a student by any referral agent at UBC Counselling Services. If a referral agent feels that MIM is a good fit for the student, they could

engage in a conversation surrounding the evidence that exercise can be helpful for improving mood, increasing energy levels, and reducing feelings of stress and anxiousness (Glowacki & Faulkner, N.D.).

3. If the student is interested in MIM, the mental health practitioner will assess the student's eligibility. Should a student decide to participate in MIM, they will then be referred to BodyWorks. Students at this stage must agree to participate in the program evaluation for MIM including self-report symptom questionnaires and a potential interview.
4. After referral, UBC BodyWorks staff screen for contraindications to physical activity and conduct a baseline fitness assessment. During this step, the student is introduced to a Graduate Research Assistant (the author) from the Pop-PA lab in charge of the program evaluation.
5. The student will then go through the six-week individualized exercise program.
6. Students who are selected based on sampling criteria participate in an interview. All students complete a questionnaire at the intervention's conclusion, and again 6-weeks post the intervention (week 12).

3.2 Eligibility

To be referred by Counselling Services to the MIM program, students must be: 1) diagnosed with clinical depression and/or have mild-to-moderate symptom severity (PHQ-9 score >5-19), 2) a current UBC student (graduate or undergraduate, part-time or full-time), 3) able to answer questions and read written English, 4) exercising <2 times per week, at any intensity, for thirty minutes per bout.

Exclusion criteria included 1) UBC faculty, staff or alumni, 2) active suicidal ideation/ imminent risk of harm to self or others, alcohol or substance use, serious mental illness, current or historic eating disorder, or other features that, in the opinion of the mental health provider, make the person a poor fit for exercise-based intervention, 3) physical illness that makes exercise unsafe, 4) exercising >3 times per week, at any intensity for thirty minutes.

BodyWorks then administered the Get Active Questionnaire (GAQ) as pre-screening for physical activity to ensure safety of participants. Participants could be referred to a physician prior to enrolling in the exercise program if potential risk factors were flagged on the GAQ (e.g. high blood pressure, previous treatment of heart disease, etc.).

3.3 Training

3.3.1 Counselling Services

A 20-minute zoom training session was held between the Pop-PA lab and all staff at Counselling Services (including all referral agents) in September 2023. This included a review of the evidence on exercise prescription, a general overview of MIM (location, program components, introduction to BodyWorks trainers, SDT), and an explanation of the referral process (eligibility/ ineligibility, how to complete the referral form). All staff members were present. A second training session was held over zoom during the second school semester. This 60-minute session involved an overview of MIM, an update of the referral processes and eligibility, as well as a program update of how many referrals were received in term 1 of the school year and general SP feedback. This zoom session ended with a question-and-answer period from Counselling Services staff. Approximately 28 staff members were present out of the potential 36. Throughout the program year the Pop-PA lab continued outreach with CS by sending email reminders and updates on program capacity and connected with individual CS

members on a case-by-case basis to address questions or concerns. To remind staff about the referral process, MIM posters were listed on bulletin boards in CS staff offices and MIM info cards were provided as a guide for speaking to students about referrals. Lastly, a comprehensive program manual was provided as a resource which explains all aspects of MIM for CS, BodyWorks, and researchers in the Pop-PA lab.

3.3.2 BodyWorks Staff

All BodyWorks EPs completed the CSEP 10-hour interactive textbook course for exercise and mental health. This is an interactive resource designed to improve EP's mental health literacy and provide support strategies and recovery-focused training plans. A lunch and learn was also held between the Pop-PA lab and BodyWorks staff. This training session included a review on the evidence on exercise prescription, a general overview of MIM, exercise programming for clients with depression and/or anxiety, how to apply SDT to exercise programming and depression, and an explanation of the referral process (eligibility/ ineligibility). Ten BodyWorks EPs were present who lead the MIM sessions. The BodyWorks staff did not receive further formal training during the school year but were supervised by an Exercise Physiologist and had continual feedback, practice, and training where needed within their own team. Further, the MIM program manual was provided as a resource for EPs to reference. When needed, EPs could contact the Program Coordinator for MIM (the author) however in most cases they referred to the leading Exercise Professional for guidance on how to deliver the intervention.

3.4 6-Week Exercise Programming

The CANMAT guidelines for exercise and depression were used to design the framework for this intervention for length and duration of exercise sessions. These guidelines specify

moderate exercise intensity, with consideration of individual levels of physical fitness (Ravindran et al., 2016). For MIM, the frequency and amount of time was outlined by the research team. The content of the 6-week exercise intervention (type of exercise and intensity) was designed by BodyWorks EPs. These sessions were tailored towards SPs exercise preferences and goals. Sessions were also targeted towards improving specific fitness measures determined by the student's initial fitness assessment. Throughout the 12 personal training sessions, the program contained a mixture of aerobic and strength training. The instructors continually engaged in conversation with the students to encourage them to participate in one additional exercise session on their own per week.

During the final exercise session (12th session), participants completed the same fitness tests as they did in their initial assessment. They were then provided with a summary of any improvements in physical fitness pre-post, and a discussion on how the student may have found the program beneficial. Following, the instructor would generate a discussion about how/ if the student plans to continue exercise. Along with a discharge letter, BodyWorks then provided a list of local fitness facilities, university clubs, and activities that the student could participate in to continue being physically active along with a copy of the student's individualized exercise program.

3.5 Logic Model

To outline the role of the Pop-PA lab and my research, please refer to the logic model below.

Table 1 Logic Model

Implementation			Outcome		
Input	Activities	Output	Short term	Medium term	Long term
Pop-PA research team and providers working together to develop a collaboration and sustainable exercise program on UBC campus for students with depression.	Mind in Motion designed to provide students with an exercise-based treatment option for depression.	SPs engage in MIM 2 sessions a week for 6 weeks, 1 hour/ session. One additional at home exercise session encouraged.	Mind in Motion participants have increased levels of PA (IPAQ-SF), and feelings of autonomy, competency, and relatedness. Aspects of participant outcomes will be explored through semi-structured interviews.	SPs have: -Decreased severity of symptoms of depression (PHQ-9). -Decreased severity of symptoms of anxiety (GAD-7). -Increased sense of overall well-being (FS).	MIM continues to be integrated into the stepped care model in future years at UBC through providing an alternate treatment option for students, decreasing the burden on CS.

Chapter 4: Methodology

In this section I outline the methods for my study. First, I outline my philosophical considerations, followed by my intervention design and why the RE-AIM framework is the best choice for this program evaluation. I then explain my study protocol followed by participant and sampling framework strategies. Next, I outline my methods for data analysis and conclude with a reflexive summary of my position in this research process.

Before outlining my methodology, it is important to clarify that I was involved in the process of program implementation in 2023 as a graduate research assistant. Despite this, for the purpose of this thesis I have conducted this evaluation post-implementation. To separate myself from the implementation process, I began the evaluation process after MIM had finished for the year in May of 2024.

4.1 Philosophical Considerations

Identifying research philosophies is important to guide research processes through designing, conducting, and assessing the research (Tamminen & Poucher, 2020). While doing qualitative work, it is important to reflect on how my selected research questions are influenced by my underlying assumptions about the nature of reality (ontological assumptions), truth, and creation of knowledge (epistemological assumptions). These assumptions in turn impact my selected qualitative and quantitative research methodology (Sparkes, 2015; Tamminen & Poucher, 2020).

A paradigm is a basic set of beliefs and worldview which guides the holder in seeing the nature of the world, their place in the world, and the range of relationships to that world (Smith & Sparkes, 2014). Paradigms shape how and what researchers do, and it is argued that people are

attracted to research problems which match their own personal way of seeing the world (Smith & Sparkes, 2014).

To determine a paradigmatic approach to research, one must first identify their ontological and epistemological assumptions. Ontological assumptions are the beliefs about the nature of reality, what exists, and how (Tamminen & Poucher, 2020). As a researcher I adopt a realist ontological position, in which I believe one universal truth may exist (Tamminen & Poucher, 2020). Epistemology refers to the assumptions that an individual has about the creation and nature of knowledge (Tamminen & Poucher, 2020). I take the position of a modified dualist/ objectivism epistemology whereby I assume that the interactions between the researcher and researched should be minimized to produce knowledge that is objective as possible (Tamminen & Poucher, 2020).

As I am adopting a post-positivist paradigmatic approach to this research, my primary aim was to gain knowledge through the falsification of theory (Tamminen & Poucher, 2020). Therefore, the research process begins with a set of predictions based on previous literature, which can be proven or disproven through scientific examination (Tamminen & Poucher, 2020). For example, hypothesizing that MIM will lead to improved symptoms of depression for participants based on extensive research recognizing the positive impact exercise as a treatment for depression (Heissel et al., 2023; Singh et al, 2023). This prediction will be proven or disproven through this program evaluation. To ensure coherence in the methodology of this research, the methods I have outlined throughout chapter 4 reflect my post-positivist approach.

4.2 Program Evaluation

While designing and implementing an intervention, it is important to measure both if and why desired outcomes were or were not achieved (Biddle et al., 2021). Using the RE-AIM

framework (RE-AIM, 2023), both an integrated process and outcome evaluation was used to evaluate the implementation of the MIM program. The *Interactive RE-AIM Planning Tool* (RE-AIM, 2023a) was used to develop the measures of this evaluation. Interview scripts used for qualitative data collection were self-developed and can be found in appendix C for SPs and D for EPs and referral agents. These self-developed scripts were informed by the *RE-AIM Qualitative Guide* (RE-AIM, 2023). Further detail about the quantitative and qualitative methodology is presented in section 4.3.1 and 4.3.2 respectively.

4.2.1 Reach

Reach represents the number and representation of individuals who participate in an intervention or program (RE-AIM, 2023). This provides insight on if MIM reached students on campus. Reach of the intervention was evaluated in four ways. First, through measuring the conversion between the number of students seeking mental health support, to the number of students referred, and the number who enrolled in, and then completed MIM.

Second, I monitored and tracked the demographic and health characteristics of participants who enrolled. Given the inequities that are often seen in mental health interventions it is important to identify potential factors that influence reach such as age, gender, mental health symptoms and severity, and ethnicity (DeJonge et al., 2021). This was tracked using a baseline demographic questionnaire that students completed prior to beginning the exercise program.

Third, it is important to examine whether the referral strategy in this program was considered an acceptable way to reach students on campus with depression. Post-program interviews with the SPs, EPs and referral agents were conducted to understand individual perspectives on the current referral strategy, and how well this strategy represents the student

population seeking mental health treatment. For example, did we reach students who represent the average student population at UBC in terms of gender, ethnicity, and/or student status?

Fourth, interviews with SPs give insight towards why they chose to participate and/or drop out, and whether they participated in the third, self-guided exercise session each week.

4.2.2 Effectiveness

Effectiveness measures whether the program has achieved its desired outcome (RE-AIM, 2023) in improving mental health symptoms of post-secondary students. Intervention effects are based on the data collected from three self-report symptom questionnaires collected at baseline, at 6-weeks, and at 12-weeks from students who participated in MIM. As well, semi-structured interviews with SPs were conducted to explore student's perceived program effectiveness on their mental health symptoms. Next, I explain each measure included in these questionnaires, followed by a summary of effectiveness measures. This section of the RE-AIM framework serves as the outcome evaluation for MIM.

4.2.2.1 Self-Reported Physical Activity

Students' total amount of physical activity (in minutes of moderate-vigorous physical activity/ week) was calculated using the International Physical Activity Questionnaire- Short Form (IPAQ-SF). This is a 7-item measure using open-ended questions about the participants last week of physical activity such as "During the last **7 days,** on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?" Six of the seven items in this scale are used, omitting the final question regarding sedentary time as total sitting time is not being targeted within this exercise intervention. Answers are recorded in number of days per week or number of hours and minutes per day. This tool was selected because it has been reported to be reliable, valid, and the most suitable measure for measuring

PA in a university population (Murphy et al., 2017). Data collected from the IPAQ-SF is reported as an average of total weekly minutes spent doing MVPA, and total time spent walking.

4.2.2.2 Depression

Depression was measured using the Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001). This is a 9-item self-report measure reflecting severity of symptoms of depression. Participants were provided with 9 questions such as "Over the last two weeks, how often have you been bothered by the following problems? Little interest or pleasure in doing things." Responses are rated on a scale from 0= "Not at all" to 3= "Nearly every day." This measure calculates a total score reflecting depression severity presented as 1-4= minimal depression, 5-9= mild depression, 10-14= moderate depression, 15-19= moderately severe depression, and 20-27= severe depression. This measure was chosen because it is used by the referral agents at UBC, keeping measures consistent with our program partner's pre-existing processes. It is also easy to administer and has demonstrated validity in measuring symptoms of depression as a self-completed instrument in adolescents and young adults (Gilbody et al., 2007; Richardson et al., 2010).

4.2.2.3 Anxiety

Anxiety was measured using the Generalized Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006). This is a 7-item self-report measure reflecting severity of anxiety symptoms. Participants were provided with 7 questions such as "Over the last two weeks, how often have you been bothered by the following problems? Feeling nervous, anxious, or on edge." Responses are rated on a scale from 0= "Not at all" to 3= "Nearly every day." This measure calculates a total score reflecting anxiety severity presented as: 0-4= minimal anxiety, 5-9= mild anxiety, 10-14= moderate anxiety, and 15-21= severe anxiety. This measure was chosen because it is easy to

administer and is a has demonstrated validity and reliability when measuring symptoms of generalized anxiety in the general population (Löwe et al., 2008).

4.2.2.4 Measure of Flourishing

Students' psychological well-being was measured using the Flourishing Scale (FS; Diener et al., 2010). This is an 8-item measure reflecting self-perceived success in areas such as purpose, self-esteem, relationships, and positivity. Participants were provided with 8 statements which they may agree or disagree with such as "I am optimistic about my future." Responses were measured on a Likert scale from: 7= "strongly agree," to 1= "Strongly Disagree." This measure calculates a single score for psychological well-being. For a total score, responses from all 8 items are added. Scores range from 8-56, with a higher score representing an individual with more psychological strengths and resources. This tool was selected because it is easy to use for students and has demonstrated validity and reliability to measure mental well-being in adults with sub-optimal mental health (Schotanus-Dijkstra et al., 2016). As well, according to the dual continuum of flourishing and mental illness (Keyes, 2002), an individual with mental illness can experience optimal mental health (flourishing), just as someone without a mental illness may experience poor mental health (languishing) (Canadian Association of College & University Student Services and Canadian Mental Health Association, 2013). MIM is not only designed to improve symptoms of depression, but also overall well-being. Positive changes in the FS can indicate improvements in students' overall well-being, regardless of potential changes in symptoms of depression.

4.2.2.5 Semi-Structured Interview

Post-program interviews with SPs were conducted to understand individual perspectives on how/if the students perceived MIM to be an effective treatment option.

4.2.2.6 Summary of Effectiveness Measures

Each symptom was measured by self-report symptom questionnaires delivered at baseline, 6-weeks (end of the exercise intervention), and 12-weeks (6-weeks after the intervention).

Table 2 Summary of Effectiveness Measures

Outcome evaluation question	Symptom/ Indicator	Measures
What was the effect of MIM on the participants level of physical activity?	Physical Activity level	International Physical Activity Questionnaire-Short Form (IPAQ-SF)
What was the effect of MIM on the participants symptoms of depression?	Depressive Symptoms	Patient Health Questionnaire (PHQ-9): 9-items
What was the effect of MIM on the participants symptoms of anxiety?	Anxiety Symptoms	Generalized Anxiety Disorder Scale (GAD-7): 7-items
What was the effect of MIM on the participants psychological well-being?	Symptoms of flourishing	Flourishing Scale (FS)
Do SPs feel the intervention was helpful for them?	Self-reported by participants at post-program	Semi- structured interview

4.2.3 Adoption

Adoption, at the setting level, represents the number and representation of the people involved in an intervention or program who are willing to initiate, and participate in the program, and why they do so (RE-AIM, 2023). This provides information on how and if the interventionists adopted MIM into their practice. Adoption was evaluated in two ways. First, adherence of the Counselling Services staff to referring to the program was tracked by recording the number of staff that sent a referral out of the total number of staff eligible.

Second, it is important to examine whether the referral strategy in this program was considered acceptable, and if it was widely adopted by all potential referral agents. Post-program interviews with referral agents were conducted to understand individual perspectives on the

current referral strategy, and reasons for or against referring students to this exercise program for depression.

4.2.4 Implementation

Implementation refers to the fidelity of the intervention agents and explores the process of the intervention delivery including whether it was delivered as intended, and time and cost variables, as well as looking at the barriers and facilitators to implementation (RE-AIM, 2023). Implementation was explored in two ways.

First, post-program interviews with SPs, EPs and referral agents were conducted to examine the barriers and facilitators to the implementation of MIM for students with MDD on campus. As well, interviews explore to what extent were the key aspects of MIM delivered as intended. Interview questions included topics of organizational characteristics (e.g., facilities and staff required), the implementation processes (e.g., engaging intervention staff, training of EPs and mental health staff, referral pathway and integration into campus health care), provider characteristics (e.g., provider knowledge, skills, beliefs, and motivation to participate), and participant needs (e.g., did students show interest, does it fit student's needs, did the program foster feelings of autonomy, competency, and relatedness).

Second, adherence to the program by SPs was tracked through BodyWorks attendance records, measuring if students completed the program twice per week for 6-9 weeks as intended.

4.2.5 Maintenance

Maintenance refers to the extent to which a program becomes institutionalized as part of routine organizational practice, as well as the extent to which individual level effects are maintained for 6 months or more (RE-AIM, 2023). Post-program interviews with EP and CS staff were conducted to examine the barriers and facilitators to the sustainability of the MIM

program. As well, suggestions to improve MIM and increase chances of long-term sustainability were collected from EPs, CS staff, and SPs during interviews.

4.2.6 Summary of RE-AIM Measures

Table 3 Summary of RE-AIM Measures

RE-AIM Category	Question	Indicator	Measures	Data collection
Reach	Number of students eligible, referrals and program completers or enrollers	Tracked through number of students seeking mental health support vs referrals vs participants in MIM	Attendance registry at the BodyWorks facility	Measured via Bodyworks registration and attendance records
	What are the demographic characteristics of those referred to MIM*?*	Tracked through a self-reported demographic information	Demographic form collected at baseline	Self-report demographic form
	Was the referral strategy in this program an acceptable way to reach students on campus with depression?	Use of qualitative methods to understand reach and/or recruitment	Semi-structured interview	Self-reported by CS staff, EPs, and SPs at post-program
	Why did students choose to participant, not participate, and/or drop out of the program?	Use of qualitative methods to understand reach at setting level	Semi-structured interview	Self-reported by SPs post-program
Effectiveness	Was the implementation of this program effective at improving participants mental health symptoms and physical activity levels?	Changes in self-reported symptoms	PHQ-9, GAD-7, FS, IPAQ-SF	Self-report symptom questionnaires from SPs
		Use of qualitative methods to understand effectiveness	Semi-structured interview	Self-reported by SPs at post-program
Adoption	How many Counselling Services staff sent a referral to the program? How many did not?	Use of quantitative data collection to understand adoption at setting level.	Reflected and tracked through referral forms from Counselling Services to BodyWorks	Measured through participant referral forms

	Was the referral strategy in this program accepted, and widely adopted by all potential referral agents?	Use of qualitative methods to understand adoption at setting level	Semi-structured interview	Self-reported by CS staff post-program
Implementation	What are the barriers and facilitators to the implementation of MIM for students with MDD on campus?	Factors that influenced the implementation of this program	Semi-structured interview.	Self-reported by CS staff and EPs at post-program.
	To what extent were the key aspects of MIM delivered as intended?	Factors that influenced the implementation of this program	Semi-structured interview.	Self-reported by CS staff, EPs, and SPs at post-program.
	Did those enrolled in MIM participate in the 6-week intervention, attending twice per week until program completion?	Adherence to program by students	Attendance registry at the BodyWorks facility	Measured via Bodyworks attendance records
Maintenance	What are the barriers and facilitators to the sustainability of MIM for students with MDD on campus?	Use of qualitative methods data to understand long-term sustainability of program	Semi-structured interview	Self-reported by CS staff, and EPs at post-program
	What suggestions can be provided to improve MIM and improve the chance of long-term sustainability on campus?	Use of qualitative methods data to understand long-term sustainability of program	Semi-structured interview	Self-reported by CS staff, EPs, and SPs at post-program.

4.3 Study Protocol

4.3.1 Initial Intake

For students participating in MIM, a baseline questionnaire was administered. This included demographic information, the International Physical Activity Questionnaire (IPAQ-SF), the Patient Health Questionnaire (PHQ-9), the Generalized Anxiety Disorder Questionnaire (GAD-7), and the Edinburgh Flourishing Scale (FS).

4.3.2 Post-Program

The post-program questionnaire was administered to all students who completed MIM after their final exercise session. A 6-week follow-up questionnaire (Week 12) was also

administered. Both questionnaires included the International Physical Activity Questionnaire (IPAQ-SF), the Patient Health Questionnaire (PHQ-9), the Generalized Anxiety Disorder Questionnaire (GAD-7), and the Edinburgh Flourishing Scale (FS).

The intake for MIM participants ran from September 25th- February 5th, 2024. Interviews were conducted with SPs within two weeks of their exercise intervention's conclusion. Interviews with selected interventionists including referring CS staff and EPs were conducted between March- May of 2024.

4.4 Data Collection and Analysis

In this section I outline my methods and rationale for quantitative and qualitative data collection and analysis. The results of the following data analysis are compared to explore complementary results in categories of reach, effectiveness, adoption, implementation, and maintenance (Bird et al., 2019). For a summary of the program evaluation measures and how they are integrated, see section 4.1.6.

4.4.1 Quantitative Data Sources

Quantitative data was collected in two ways. Firstly, by self-report symptom questionnaires from SPs at three time points: baseline, post-program at week 6, and a 6-week follow up (See section 4.2). Secondly, through attendance records recorded by BodyWorks EPs.

4.4.1.1 Quantitative Analysis

Redcap is a secure web database for managing online surveys and datasets (https://projectredcap.org). It was used for administering and collecting all quantitative data including questionnaires and attendance logs. At the end of the 6-week follow up, in April of 2024, Redcap was used to compute descriptive analyses using data from all students who participated in MIM and completed all three questionnaires. All questionnaires from students

who completed the program were included in analysis (n=9), as well as 2 additional students who were still enrolled but did not have enough time to complete 12 sessions before the program closed totaling a sample of 11 students.

Outcome variables from baseline, post-program, and 6-week follow up were examined through descriptive summaries. To see short term (baseline to post-program) and maintenance (baseline to 6-week follow up) program effects on the targeted symptom outcomes, changes in mean and standard deviation were compared between time points for each outcome variable (PHQ-9, GAD-7, FS, IPAQ-SF). Inferential analyses were not planned given the pilot nature of the MIM program.

4.4.2 Qualitative Data Sources

4.4.2.1 Participants and Sampling Framework

To understand the experiences of those involved in an exercise treatment intervention for post-secondary students with depressive symptoms, I conducted semi-structured interviews with 1) SPs who participated in the exercise intervention, 2) EPs who delivered the program, and 3) CS staff who referred students to the intervention. The purpose of these interviews was to create conversations with those involved in the exercise intervention, and to have the interviewees give insight as to their perspectives, motivations, beliefs, experiences, and feelings to better understand the effectiveness of this intervention and how it can be improved in the future (Smith & Sparkes, 2016). Human beings are conversational creatures and through interviews we can better understand the richness and depth of their personal experiences in this intervention beyond a quantitative survey (Smith & Sparkes, 2016).

4.4.2.2 Sample Size

MIM was staffed to accommodate a maximum of 25 participants between the months of September- December 2023, and January 2024- April 2024. However, we were not able to predict how many people would be referred, and the program did not meet maximum capacity. For my interviews, I interviewed most SPs who completed the intervention (8/9). BodyWorks EPs were recruited via email, without connection to their managers. It was communicated that their participation in an interview was voluntary and separate from their employment at BodyWorks. BodyWorks managers were not notified of who did or did not choose to participate to mitigate any potential pressures that EPs may have felt to participate. There was a total of 5 EPs interviewed who were involved in the organization, programming, and delivery of the exercise intervention. This included 2 personal trainers, and 3 management staff members. The two personal trainers were interviewed individually, while the 3 management staff members were interviewed as a group. Upon discussion with the BodyWorks staff, we decided that it was more feasible to interview them together rather than scheduling three separate interviews. As well, because they each had specific roles in the MIM's implementation (BodyWorks registration office, program communications, and program development/team lead), we felt it would generate further discussion through a group setting. These interviews were held within two weeks of the intervention's conclusion (May 2024).

For referral agents, 5 CS staff (wellness advisors, mental health practitioners, manager) involved in the referral process for MIM participants were interviewed within one month of the cutoff date for referrals (March-April 2024). Similarly, CS staff were recruited by email invitation. All CS staff who agreed to participate were interviewed.

The point at which data saturation occurs in qualitative research is not clearly defined in current literature. Some research suggests that data saturation occurs at around 20 participants (Smith & Sparkes, 2016), while others suggest an average of 9-17 interviews to demonstrate saturation in qualitative research (Hennick & Kaiser, 2022). This flexible range of interviewees seemed appropriate as I moved towards the recruitment phase of this research.

4.4.2.3 Sampling Framework

I conducted semi-structured interviews. This method includes the use of a preplanned interview guide of open-ended questions focused on a specific topic, with flexibility to ask unplanned questions for generating additional insights (Smith & Sparkes, 2016). Purposive based sampling was used, in which participants are sampled in a way which is strategic and relevant to the research questions (Bryman, 2016). Within this, a criterion sampling approach to purposive sampling was used when selecting SPs in which all individuals who met the criterion required for the exercise intervention were included (Bryman, 2016). I intended to have a selection criterion for SPs that was also based on rates of engagement in the exercise program. All SPs who were selected were invited to participate in an interview by email from myself. CS staff and EPs were invited by email from their management teams, and directed to reach out to myself if they would like to participate. This was to ensure that their participation was not known by their employers. However, students who dropped out of the program or did not enroll did not agree to participate in an interview. All 8 students interviewed completed the program. All counsellors and EPs who were involved in MIM were asked to participate in an interview until I reached my desired number of interviewees (5 interviews each). Ultimately, the number of interviews that I conducted with the interventionists was based on the number of those who were willing to give feedback. At the time of data collection, I decided to include fewer personal trainers and more

management staff from the BodyWorks team to ensure the best quality of feedback about the implementation of the exercise program. As most of the BodyWorks personal trainers were working in this role for the first time, I felt that the perspectives from those on the team responsible for program design and coordination contained more depth and richness (Braun & Clarke, 2021).

Interview scripts were self-developed and informed by the *RE-AIM Qualitative Guide* (RE-AIM, 2023) and were pilot tested with a fellow graduate student in my lab. These interviews were conducted face-to face, or alternatively through Zoom Video Communications Inc. (Zoom) as a remote video conference option. In person interviews allow for visual cues which help to facilitate rapport and inform the interviewee if the interviewer is still listening (Smith & Sparkes, 2016). The in-person interviews were conducted in a comfortable place such as the location of the exercise intervention, the Bodyworks gym, or at the Pop-PA lab. Only the participants and I were present in the interview.

Online interviews through Zoom were synchronous, with the ability to see each other through the monitor and engage in dialogue in real-time. Potential challenges of using zoom include technical difficulties, and some participants may struggle to find privacy for the location. Despite this, Zoom does present some advantages. This option was included to allow for more flexibility in interviewees' schedules and eliminate the barrier for those who are geographically distanced. It was a convenient option for students with busy schedules to be able to meet remotely rather than discussing back and forth a time and location where the interview could take place. As well, online interviews may be more comfortable when discussing sensitive subjects. In this case the participant may be more willing to discuss sensitive subjects, such as

depression and anxiety, when they are in a comfortable location and are communicating without the physical presence of the researcher (Gray et al., 2020; Smith & Sparkes, 2016).

All interviews were recorded using a recording device in person, and through the zoom audio recording function if online. In anticipation of potential technical difficulties, I always recorded on a second recording device as a back-up for both in person and online interviews. The recordings were stored on an on-campus computer located in my research lab. The computer is encrypted, password protected, and in a lab which needs a key to enter. The interviews were transcribed verbatim using Otter AI (Otter AI, 2016) onto the same computer within my research lab.

To add to my transcription data, I also collected data through taking field notes during and as soon as possible after the interview (Watt, 2007). These reflexive notes helped me to recall details about the interview such as participant's unexpected emotions, reactions, themes of thought, nervousness, eye contact, and more (Smith & Sparkes, 2016). These field notes also aid in self-reflexivity in considering notice my own reactions as the researcher (Watt, 2007).

4.4.2.4 Number of Interviews

Only one interview was conducted per person. The length of the interview varied between 45-60 minutes for each interview. Conducting only one interview per participant presents its challenges through limiting the amount of time one can generate rapport, trust and empathy between the interviewer and interviewee, and relying on memory recall and bias (Smith & Sparkes, 2016). However, in this context I, the interviewer, was introduced at the beginning of the exercise program as a graduate research assistant (author) to all SPs, EPs and CS staff. This main point of contact was an opportunity to gain rapport with SPs and generate trust and empathy before connecting again for a semi-structured interview at the exercise intervention's

conclusion. Additionally, I played a leading role in the delivery of the staff training sessions with delivery and CS staff, again giving the opportunity to gain rapport with interviewees.

I conducted all interviews for this program evaluation. At the time of the interviews, my credentials include having a Bachelor of Arts in Kinesiology, and experience as a CSEP-certified personal trainer. My occupation was being a graduate student, and my training in conducted interviews was based on guidance and feedback from my supervisor, Dr. Guy Faulkner, and fellow lab mates. All interview participants understood the purpose of the research study based on the letter of informed consent and were aware that I as the interviewer was a graduate student at UBC and was also involved in the coordination of MIM.

4.4.2.5 Qualitative Analysis

I adopted a content analysis approach to analyze the qualitative data collected during interviews. I selected this method of data analysis as it places an emphasis on reoccurrence of concepts or themes in a more surface level way. By identifying broad common concepts or themes between my interview groups, I can begin to understand how MIM can be improved in the future. Content analysis is a method for analyzing data which involves combining content from different sets of data, such as interview scripts, to provide an overall summary (Vears & Gillam, 2022). This process involves the researcher coding themes with codes that 'arise' during the process of content analysis (Vears & Gillam, 2022). I was the only coder for these interview transcriptions. Each document was coded several times, followed by a process of comparing, grouping, and dividing groups of codes to finalize content categories (Vears & Gillam, 2022). Each content category was related to the research questions and represents a broad idea which summarizes a group of related content codes (Vears & Gillam, 2022). During my qualitative content analysis, I first went through the data for CS staff, then EPs, then SPs. Each group of

transcriptions were analyzed separately and combined once similar codes reflecting the RE-AIM framework were developed for each.

NVivo 12 Pro was used to transcribe and code relevant themes in the interview scripts (Middelweerd et al., 2014). After transcribing, I began reading and re-reading the interviews to become familiar with the data. Then, the text was divided up into smaller units and coded (Erlingsson & Brysiewicz, 2017) by RE-AIM dimension. Once the codes were developed for each dataset (SPs, EPs, and CS staff) they were combined, by RE-AIM dimension, to identify overall categories and themes representing the barriers and facilitators to the implementation and sustainability of MIM. Coding was done through a deductive approach first using the RE-AIM domains, followed by inductive approach to identify re-occurring categories and themes within each domain. The steps followed for content analysis were replicated based on Erlingsson & Brysiewicz (2017).

4.5 Considerations in Methodology

This research uses a mixed methods design with the integration of process and outcome variables to provide a multifaceted understanding of how the program can be improved in the future. Gaining feedback on patient symptom outcomes through quantitative analysis helps to provide a better understanding of the intervention than through qualitative interviews alone (Kajamaa, Mattick, & de la Croix, 2020). The qualitative portion of this research was used for the process evaluation, and the quantitative data was used for the outcome evaluation and the results are integrated in the results (Chapter 5) and discussion (Chapter 6) portion of this research using the RE-AIM framework. Here the consonance or dissonance between datasets can be compared. For example, is there a difference between measured symptom outcomes and how

participants perceive they have, or have not benefited? What can we learn from different, and perhaps conflicting, viewpoints of this program?

The following section is guided by my post-positivist philosophical paradigm and explores aspects of my research including ethical considerations, addressing quality and rigor, and my reflexivity as a researcher.

4.5.1 Ethical Considerations

Ethics in all research is important to ensure one is protecting the rights of your participants and acting morally with respect and consideration of them and the research implications (Palmer, 2016). Next, I will outline some important procedural and personal ethical considerations I took during each step of this study to ensure that I was 'doing the right thing' as a researcher (Palmer, 2016). While many of the following steps I outline are guided by processes for ensuring ethical conduct in qualitative research, I chose to follow these same guidelines while conducting the quantitative aspect of my research as I felt they were appropriate to guide the consideration of ethics at every step (Palmer, 2016) of the mixed methods research process.

4.5.1.1 Procedural Ethics

Procedural ethics refer to ethics in practice, a continual process which involves rules and guidelines that are monitored, and approved by ethic committees (Palmer, 2016). Before beginning this proposed research, MIM was approved by the UBC Behavioural Research Ethics Board (Ethics ID #: H17-02498-A011). This approval ensures that the research conforms to international standards on ethical conduct regarding research issues such as privacy, confidentiality, informed consent, and minimizing the risks of participation in the research (Palmer, 2016; Steffen, 2015). As a researcher, I also addressed these issues through ongoing informed consent with the participant.

Informed consent is the "process of outlining the aims of the research, methods, risks, benefits, intended outcomes, and the ways in which the data will be presented" to the participant (Palmer, 2016, p. 320). Informed consent was received before initiating surveys and interviews. Additionally for the interview process, I emphasized to each participant that they were not obligated to answer every question and were free to end the interview at any time. It was important here that I empathized with participants, and checked in on participant's well-being during, and after the interview. As I am researching sensitive topics which put the participant at risk of being in distress, I was also prepared to direct participants to further mental health support if needed after the interview (Palmer, 2016).

Regarding privacy for the participants, I was mindful of the interview location to ensure their safety and comfort. It was important to be respectful that the topic was sensitive, and that participants may have requested a private location on campus or select the option of video interviewing to stay in the comfort of their own home. Confidentiality protects the information that the participant shares about themselves (Steffen, 2015). As previously mentioned, interview recordings and transcriptions were stored on an encrypted and password protected computer on UBC campus, the password was only be known by my research supervisor (Dr. Guy Faulkner) and myself as the primary researcher. Identifying information was replaced with an identification number when presenting the data.

4.5.1.2 Personal Ethics

It is important as the researcher to be aware of one's own ethical position and practice in this proposed research, and how my assumptions and biographies can impact my interactions with participants (Palmer, 2016). Throughout the research process, it is best practice as the researcher to continually reflect on my own actions, ideological positions, and beliefs, and how these may

impact others (Tracy, 2010; Steffen, 2015). Key characteristics that I reflect on and embody include portraying empathy and being honest and transparent while acting with humility (Palmer, 2016). As well, it is important for me to be sensitive as the researcher and consider the interactions and power relations that exist, which may impact participants (Steffen, 2015). I am a student at UBC working with fellow SPs. Being respectful and attentive to this relation is essential. Some strategies to do this included ensuring confidentiality, engaging in active listening, and addressing participant's potential concerns empathetically. I also need to consider the power that I have as the researcher in the interpretation and presentation of the data and ensure that I do so in a way which correctly represents the participant's accounts (Steffen, 2015). A strategy to mitigate this was within the process of informed consent and providing the participant with a detailed description of the data analysis process (Palmer, 2016). I also offered a form of member checking in allowing the participants to check the data collected from their interview and decide if it was a correct depiction of their experience, and as well give an opportunity to retract statements (Palmer, 2016).

4.5.2 Addressing Quality and Rigor

Rigor in qualitative research has multiple meanings, but may include high levels of robustness and sufficiency, strong methodologies, clear epistemology and ontology, and cohesiveness of concepts (Smith & McGannon, 2018). Rigor is essential for qualitative research to be considered of high quality (Tracy, 2010). Although clear guidance for assessing rigor exists for both qualitative and quantitative work, there is little guidance for judging quality and rigor for mixed methodology in public health research (Brown et al., 2015). To overcome this, Bryman et al., (2008) suggest using a combination of traditional research criteria. Using this suggestion, I used a different set of criteria to judge the quality and rigor of the qualitative and

quantitative portions of my research (Bryman et al., 2008). Further, I believe that the evaluative criteria used for my research should be specific to the goals of the study, and my choice of methods, suiting the notions of a post-positivist approach (Burke, 2016; Smith & McGannon, 2018).

The criteria I used to judge the quality of the quantitative portion of my research included consideration of the internal validity of the instruments, and generalizability of the findings (Brown et al., 2015; Bryman et al., 2008). Validity is further explained with each self-report instrument selected in section 4.1.2, and generalizability discussed in Chapter 6.

To judge the quality of the qualitative portion of my research, I as the researcher must make ongoing judgements and decisions about which criteria should be used to evaluate the research as the study develops over time (Burke, 2016). The criteria I selected were flexible throughout the research process to best fit the characteristics and circumstances of the study (Burke, 2016).

The list of criteria that I used includes substantive contribution, width, coherence, triangulation and credibility. First, substantive contribution considers how the research contributes to the understanding of social life, and if it provides a significant contribution conceptually, practically, morally, and/or methodologically (Burke, 2006; Tracy, 2010). I achieved this through the translation of the findings to inform EPs, and mental health counsellors. One way the findings were translated was through a program report infographic, which was provided to all program partners including the BodyWorks staff and CS staff (see Appendix K). I also plan to submit the findings of this program evaluation for publication to contribute to the literature on building referral pathways on exercise-based treatments for depression. Second, width refers to the quality of the interview, proposed analysis, and overall comprehensiveness of the evidence (Burke, 2006). Here I used numerous quotations and

suggestions of alternate explanations within the final presentation of the research to "support the readers judgement of the evidence and its interpretation" (Burke, 2016, p.335). Third, checking for coherence ensures that a complete and meaningful picture has been conveyed in the results (Burke, 2006). A coherent study is one that achieves its purpose and uses methods and procedures which fit its stated goals (Tracy, 2010). This is an ongoing process whereby I continually reflected on my methods and procedures with my overarching research objectives, and philosophical paradigms. Fourth, using triangulation involves gaining a comprehensive view of the research questions through comparing data from different measures of inquiry (Ramanadhan et al., 2021). In this study I will be exploring data from both semi-structured interviews, self-report questionnaires, and attendance records to gain a nuanced understanding of how well the program was implemented. Lastly, credibility ensures that the researcher has spent an adequate amount of time with the participants and that their reflections on the researchers' interpretations were considered (Burke, 2006). This can be identified as having thick descriptions, member reflections, concrete details, and showing rather than telling (Tracy, 2010). This was a significant quality check for my research as I was only conducting one interview with the participants and so it is important to ensure that enough time was dedicated to their reflections. I gave thick descriptions in the quotations and analysis that I used when developing and presenting the themes. I also offered member reflections to allow the participants to review the transcriptions and add, clarify, or retract statements. Two participants chose to review their interview transcriptions and removed any statements that they were no longer comfortable with.

To further ensure that the quality and rigor of this study were transparent and understood, a supplemental file is provided which outlines greater detail on the coding and data analysis procedures (Ramanadhan et al., 2021). This supplemental file includes the Consolidated Criteria

for Reporting Qualitative (CORE-Q) checklist (see appendix I), a reporting checklist to communicate the details of the post-positivist analytic approach (Ramanadhan et al., 2021). The CORE-Q checklist was helpful to identify missing details and ensure that all important aspects of the methodology have been explained (Tong et al., 2007).

4.5.3 Reflexivity

Through qualitative data collection and analysis, the researcher acts as the primary 'instrument' (Watt, 2007). Reflexivity involves deconstructing the impact that the researcher has on their research through self-examining their emotions, experiences, and positionality (Trainor & Bundon, 2021). It is an extension of checking for quality in qualitative research, and so it is important to address the potential impact that a researcher's social position, beliefs, and lived experiences can have on the research process (Berger, 2015). A growing body of literature has also begun to discuss the use of reflexivity in quantitative work as a tool to encourage researchers engage more thoughtfully with each step of the research process (Jamieson et al., 2023). Through reflexivity researchers can "become aware of what allows them to see, as well as what may inhibit their seeing" (Watt, 2007). This is viewed as a continual process of self-reflection, and self-evaluation of one's positionality and its effect on research processes and outcomes (Berger, 2015). Although more traditionally discussed in qualitative methodology, the act of reflexivity may be as important in quantitative work through prompting researchers to acknowledge their positionality and maintain transparency and openness with how and why decisions are made in the research process (Jamieson et al., 2023).

To engage in reflexivity throughout this research process I recorded my own experiences during the interviews in a reflexive journal. Using a research journal to record short notes to oneself during the research process can help with any challenges or emotions that may come up,

to discover ideas and thoughts, and with identifying themes within the data (Watt, 2007). This engagement in journal writing can help researchers identify why and how they think, and to help identify potential biases in the way that conclusions are made (Watt, 2007). I also discussed some of my reflections with my research supervisor, Dr. Guy Faulkner, as a critical friend, to help me further evaluate my own biases and assumptions, and to explore alternate explanations (Burke, 2016).

Positionality of the researcher can include their personal characteristics, such as age, race, affiliation, sexual orientation, personal experiences, biases, beliefs, emotional responses to a participant, and political and ideological stances (Berger, 2015). Furthermore, it is best to break down my positionality when interviewing the SPs, the EPs, and the mental health counsellors.

My interactions with the SPs were complex and took on both an insider and outsider position. As a fellow student myself, I share the experience of the stressors of post-secondary mental health at the same institution. These shared experiences and insider status may have the benefits of understanding nuance and implied context, to further generate conversation, and express empathy throughout the research process (Berger, 2015). It has been important to be reflexive during the research process on how my shared experience could further impose my own values, beliefs, perceptions, and projections in a biased manner (Berger, 2015), and how this impacts how the data is presented.

Contrary to being a fellow student, the SPs may have viewed me as an outsider due to my age, profession, and perceived health status. The age range for participants is 18-25 and I am above this age. This may be intimidating and make me seem more like an outsider despite my student status. I also disclosed that I have a background in working as an EP myself. This may have added to the perception that I am a healthy, fit, individual who already exercises regularly

and cannot personally relate to individuals who are new to exercise although I have worked with individuals with varying levels of exercise experience and mental health conditions.

While interviewing the EPs in this research process, I present an insider positionality as a fellow EP who has worked with patients with depression in the past. This again can help to equalize the research relationship, understand linguistics, and generate richer conversation through more nuanced conversational prompts (Berger, 2015). However, in this context the interviewees may not have shared content that they feel is obvious. This may result in a gap in the information that is received during the interview (Berger, 2015). For this reason, I consulted my research supervisor to aid in the development of the research questions and prompts as this can add the perspective of an outsider and may provide a fresh perspective on research questions that I may have dismissed myself as being 'obvious.'

Finally, when interviewing the mental health counselors, I took both an insider and outsider approach. As a fellow practitioner, I am an insider. As an outsider, I am a practitioner of a different field of work, but additionally a student, a researcher, and likely younger in age. This may have helped the interviewees to feel empowered as the 'expert' in the topic, but also may present challenges based on their own beliefs and personal experiences.

I have described some strategies that I implemented to be reflexive throughout the research process such as using a reflexive journal, and having a critical friend (Berger, 2015). Through reflexivity, I can identify, evaluate, and control how my positionality shaped this research process and ultimately impacts the meanings which are constructed from the data (Berger, 2015). This research presented opportunities for me to grow as a researcher and EP. As well, I hope that it adds substantive insight on the mental health benefits of exercise interventions, and their integration into the treatment of depression.

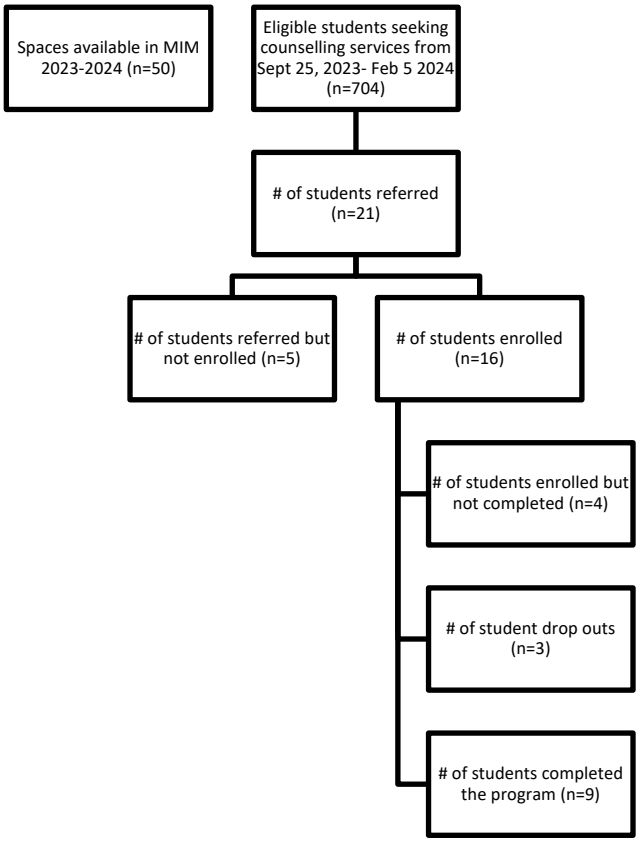
Chapter 5: Results

5.1 Reach

5.1.1 Student Reach

The first measure of the reach of MIM is represented by the number of UBC students who participated in the program in comparison to: the number of students eligible and seeking mental health support, the number of spaces available in the program, the number of students referred, referred but not enrolled, enrolled but not completed, and number of program completers. The reach of student referrals and enrollment is represented below in figure 1 (see appendix L).

Figure 1 Flowchart of Student Reach for MIM



MIM received 8 referrals in the first academic term (T1) between September 25th, 2023, and December 31st, 2023. After a slow uptake in T1, the Pop-PA Lab and Counselling Services

on campus made two adjustments to the program to increase uptake and the number of referrals. Firstly, the intake eligibility was changed from a PHQ-9 range of 10-19 in T1 to 5-19 in T2 to better reflect the low-moderate range of symptoms of the students who were seeking help from Counselling Services. Secondly, a second zoom training session was held with all counselling staff with the attendance of BodyWorks management staff at the start of T2. Between January 1st, 2024- February 10th, 2024 (referral cutoff date for the year) the program received 13 referrals.

Overall, the reach of students was limited during the year and the recruitment of students was slow. Approximately 3% of eligible students enrolled in MIM. However, once enrolled, the drop-out rate was low with 13/16 (81%) enrolled until the program closed in April of 2024. Of those 13/16, 9/16 completed all 12 sessions, and 4/16 were enrolled but did not finish their sessions before the last day of the program.

5.1.2 Demographic characteristics of student participants

The average age of students was 24, with 81.25% (13) being undergraduate students and 18.75 % (3) being graduate students. Participants were mostly female with 68.8% identifying as female (11), and 31.3% (5) male. The ancestry of students enrolled was 43.8% (7) White, 6.3 % (1) South Asian, 31.3% (5) East Asian and Southeast, 12.5% (2) Middle Eastern or North, 12.5% (2) British/ Irish, 12.5% (2) Mediterranean, 6.3% (1) Eastern European or Russian, 6.3% (1) Métis, and 12.5% (2) other. All students reported being enrolled in a full-time course load (minimum 3 courses per academic semester), aside from one student who was part time. Of those enrolled, 10 were domestic students (62.5%) and 6 were international (37.5%). Most SPs lived on campus (56.3%, 9), with the remaining living off campus with roommates/ friends (18.8%, 3), with family (18.8%, 3), or other (16.3%, 1). Within the last 12 months, students reported being

diagnosed or treated for additional mental health conditions including: generalized anxiety disorder (43.8%, 7), depression (62.5%, 10), ADHD (6.3%, 1), panic disorder (25% 4), obsessive compulsive disorder (12.5%, 2), sleep disorders (12.5%, 2), and other (12.5%, 2). Notably, most participants (81.25%, 13) were receiving one or more additional treatments, outside of exercise, for depression at the time of referral.

Baseline self-report symptoms and PA levels from the 16 students that enrolled in MIM are displayed in table 5 (pp.78). On average, the baseline sample had moderate symptom severity scores for depression and anxiety and were not meeting Canadian MVPA physical activity guidelines (Ross et al., 2020). Effectiveness pre-post data in section 5.2 includes self-reported data from the participants who completed surveys at all 3 time points.

5.1.3 Reach of referral strategy

Both CS staff and EPs expected a larger program reach for student referrals. Most CS staff found it surprising that we did not reach maximum capacity of MIM. BodyWorks staff agreed that the number of students enrolling in MIM was less than anticipated. Four themes were created reflecting whether the current referral strategy was an acceptable way to reach students on campus with depression: 1) student interest in exercise, 2) previous exercise experience, 3) need for further reach, and the 4) need to reach the right students.

Student Interest in Exercise

With the current referral strategy, CS staff highlighted that MIM did not meet some student's treatment interests. Further, using CS as the only way to reach students on campus might not reach students who are interested in an exercise-based treatment option. For example, one counsellor described:

> "I had some conversations [with students] where I did discuss [MIM] as an option... that wasn't what they wanted, they wanted to do talk therapy... It just didn't quite match their own internal like goal for what they were coming in with." (CS1).

For referrals that were successful, the majority of CS staff reported that if students were already interested in using exercise for their mental health, they were open to a referral to MIM. All SPs mentioned that they were interested in engaging in exercise prior to CS offering MIM as a treatment option. This suggests that the reach and referral of students was most successful when the student had a preexisting interest in exploring opportunities to exercise.

> "It really intrigued me [MIM], because when I brought it up to my counselor the conversation was like, me trying to get back into working out and go into the gym. And my problem was getting more comfortable with the exercises. And it was a bit tough with like, the high traffic in the campus gym... And yeah, I was just excited because it was something I'd never really done before. Like having I guess someone who really knows like, what they're doing show me the ropes." (SP13)

Previous Exercise Experience

For one counsellor, referrals were most successful if the student had previous exercise experience but were currently inactive.

> "Sometimes maybe for students who have shared like that they used to exercise but now for a while they've not been exercising… I do feel like the referrals that did come through were situations like that, because then it's like they can access the memory or like, the optimism of having felt that way and having used exercise previous method, and then being open to like resuming that kind of structure with some help and accountability. Maybe versus someone who's never exercised before, may feel a little more intimidating for them" (CS4)

Half of the students reported previous positive exercise experience either in organized sports or through self-guided exercise routines. A reason they were interested in referral was because they were not currently active and were looking for support to incorporate it back into their daily routines.

> “In the counseling session I mentioned that running was helpful to me in managing my mental health and the counselor immediately recommended I joined MIM, and it was a very easy process... the reason I was excited to join is that I know that running helps, but in that time I was having a hard time like pushing myself to actually run because it was just me motivating myself and my motivation is low." (SP2)

On the other hand, having no prior exercise experience seemed to also generate some success with referrals. Several students had no previous exercise experience outside of primary or secondary school gym classes. One reason they chose to participate was to learn how to exercise as a beginner.

> “Working out is definitely something that I never would have considered that I could ever be good at. I viewed it kind of as a source of humiliation in the past. So, I was a bit apprehensive, but excited to learn and kind of feel like this might actually be my chance to get comfortable in an exercise environment… And it turned out a lot better than I expected so I'm really glad I took that leap of faith at the beginning." (SP9)

Need for Further Reach

Considering the current reach of students to the demand for mental health support on campus, both EPs and SPs agreed on the need to expand reach of MIM. Most EP staff and students felt that there is a need to reach students beyond Counselling Services. Students who may also benefit from MIM may not necessarily be willing to go through counselling to enroll in this treatment option. Further, more promotion is needed to increase awareness about MIM across campus.

> "But in terms of like, other ways to hear about it… I know for sure, like there's probably like a lot of students who can benefit from it but maybe they're not liking counseling, or they haven't brought it up with their counselor. So if there were like additional avenues to kind of have it have it out there. But I guess at the same time also not have it oversaturated so then you're not having waiting lists, then people who actually like can benefit from it are getting that opportunity. Yeah, so yeah, finding that good middle ground." (SP13)

Both EPs and SPs mentioned the frequent wait times to receive mental health care at CS. Having additional recruitment methods for referrals could allow students to enroll in MIM sooner.

> "I think it can be hard when you're a student going through what they are to advocate for yourself, at least when I was a student, I was told counseling always has a wait list, because I'm thinking, oh, I won't even bother. So finding another way potentially, to help bring them in to get help." (EP3)

Need to Reach the Right Students

Lastly, despite the need for further reach, most SPs and EPs highlighted the importance of reaching the right students who need the program. While a CS referral may be a good way to do this, there may be additional referral pathways which can increase reach. Two students mentioned that further reach would help student awareness that this treatment option exists on campus, but that it is important to filter through to students to make sure it is provided to those who need it and would benefit the most.

> "I think if it wasn't through counseling, that a lot of people would just they want to get into the program just so they can have free personal training. They might not have like, mental health issues. So I think this is a good like, filtering process for people who I feel like really need this specific environment... So they should be mentioned by like a lot of counselors or like, wellness advisor or like, people who work at the UBC hospital or something." (SP5)

Suggestions of how to improve the referral strategy and best reach students for future years of MIM are discussed in section 5.5.3.2.

5.1.4 Why did students choose to participate, not participate, and/or drop out of the program?

Interviews with SPs were used to understand reach at a setting level. For example, why did students choose to participate in MIM? Why were they interested in a referral from CS?

5.1.4.1 Facilitators to students' attendance

Post-program interviews with students explored the factors which facilitated continued participation in MIM sessions after enrollment. Four themes presented as facilitators to attendance including: 1) accountability, 2) the BodyWorks experience, 3) the program design, and 4) student enjoyment.

Accountability

Accountability presented in two ways. First, most students mentioned that the accountability of having to show up for a booked appointment, and the accountability to their EP, facilitated and motivated them to continue to attend sessions until the program was complete.

> "So what I really liked is the compulsory part… Like for me in my experience, I don't want to waste time for both me and another person. So that's like a very important measure for me to like, be on time and actually show up because on my own, all by myself, I'm not sure how much of the exercise I would actually achieve. So with the personal trainer I think that's a good way to hold me more accountable." (SP1)

Secondly, SPs felt this appointment served as accountability in taking care of themselves and taking action towards their own health.

> "It would a commitment to myself that would help me show up for my health the way I had been envisioning what doing so it'd be the action to my thoughts. The program would give me that support I needed to commit to my health. So that was my main goal was like, let's just get myself there." (SP12).

Similarly, another student said:

> "So, in my opinion, the reason why therapy works, or the reason programs like this work is because people have to commit themselves, and they have to show up, and they have to put in the work. And so if you do that, I think it really just like helps to build confidence. And then it's like, you're helping yourself kind of which is really important, I think, and any type of like, solution for mental health" (SP4)

The BodyWorks Experience

SPs mentioned several elements of the exercise facility that facilitated their motivation to attend sessions twice per week. All students mentioned how the facility was private and not crowded like many fitness facilities on campus. The quiet environment prevented the students from feeling overwhelmed and allowed participants to feel more comfortable.

> "I feel like because I wanted to learn more in a like a not a very scary like gym bro environment...It's nice. I like how it's kind of just the BodyWorks people there made it a lot less intimidating." (SP2).

Further, the rapport between student and trainer facilitated and motivated students to continue to attend sessions until the program was complete. The SPs reported that the EPs' knowledge and welcoming environment that they created was a reason for attending sessions.

> "And like the environment there was always warm and welcoming. So that definitely helps be more comfortable, especially like early on when you didn't know anyone there. It's very easy to get acclimated. And yeah, everyone established a really good rapport with each other. So yeah, it's made you very comfortable and with the environment and like the exercises you're going to be working on." (SP13)

Three SPs mentioned the convenience of the gym on campus facilitated attendance due to its proximity to their classes or where they were living on campus. As well, most SPs mentioned that the amount of BodyWorks time slots available facilitated attendance until the program was complete.

> "I liked it. It was like gave me the opportunity to be in a different part of campus never been there before. Okay, I know it'd be kind of out of the way for some people. But I thought it was like accessible. There's like a bus stop right in front basically." (SP5)

The Program Design

Students mentioned several aspects of the program design as facilitators to their continued attendance. Firstly, students mentioned that the effectiveness of the program design and seeing improvements in their physical health facilitated and motivated them to continue to attend

sessions until the program was complete. Further, all SPs reported that the program design of 6-9 weeks, 2X 60 minutes per week was feasible within their school schedule and that this allowed for their participation. As well, half of the students mentioned that the program being free was a facilitator to their participation.

Lastly, students reported that the EPs displayed competence in the delivery of the program and were very knowledgeable. One student mentioned instances where the EP referred the student to additional resources rather than engaging in conversation surrounding mental health topics. The professionalism in the EPs delivery of the program made students feel welcome and safe to attend.

> "The staff were extremely knowledgeable to give exercise variations and … they were always very encouraging, friendly, supportive, welcoming, which helped, like ease any anxiety or awkwardness or intimidating." (SP12)

Student Enjoyment

Finally, all students listed enjoyment as a major facilitator which motivated them to continue to attend sessions until the program was complete.

> "So there was never a time where I wanted to stop, especially because I really am learning and seeing the difference in myself. As well, building that confidence and so it's, you know, it made me feel good in a way that I haven't felt in a very long time. It was kind of that feeling of … why would I want to stop doing something that makes me happy?" (SP9)

Similarly, SP5 said,

> "I just found myself enjoying coming to each of them. Although it was tough to do the actual exercise, I know it's good for me, like both socially and physically, mentally something to do for myself.... I think in general; I enjoyed it. It was something I did look forward to and it was nice getting to exercise and learn new things and just do something that I'm not used to. " (SP5)

5.1.4.2 Barriers to attendance

Two themes presented as barriers to attendance including: 1) school timetables, and 2) health symptoms.

School Timetables

The biggest barrier that influenced attendance was their school timetables. Most students mentioned that their class schedule, exam schedule, and semester breaks presented some barriers to attending twice per week at BodyWorks. One student completing a master's degree mentioned that they had a flexible school timetable that did not interfere with their BodyWorks attendance.

Health Symptoms

Several SPs mentioned physical or mental health symptoms to be a barrier to attending their sessions including physical illness, lack of energy, lack of sleep (insomnia), and seasonal worsening of depressive symptoms.

> "Towards the end of the program and daylight gets shorter I do feel like it's more difficult for me to go in. Like it's not easy, like mentally, it's not as easy for me to get prepared. I think physically, it's, it's fine, like the exercise doesn't create a lot of like discomfort or anything like fatigue at all. It's just because how SAD is it just harder in the winter for me to get up." (SP1)

Importantly, interviews with SP were voluntary and SPs who dropped out, or who were referred and did not enroll, were not interviewed. However, from communication between BodyWorks staff and CS staff, those who were referred and did not enroll listed reasons such as having a busy school timetable that did not match BodyWorks availability, finding an exercise alternative elsewhere, or having an injury that prevented participation. Suggestions to mitigate these barriers are listed in 5.5.3.

5.2 Effectiveness

5.2.1 Short-term effects of MIM on targeted symptom outcomes

Pre-post self-report symptom changes are displayed in table 4. Data was collected from 16 students at baseline, 11 at post-program, and 11 at 6-weeks post program. From baseline to post-program, and 6-weeks post-program, there was a reduction in depression and anxiety symptoms and an increase in improvements in students' overall well-being. Six out of 11 students reported having a mild depression score (1-4 on PHQ-9) at 6 weeks post-program. As well, 6/ 11 students reported having a minimal anxiety score (0-4 on GAD-7) at 6 weeks post-program.

Similarly, there was a self-reported increase in physical activity. Eight out of eleven students had an increase in MVPA post program, five maintained this improvement at 6-weeks post program. Four students reported increases in time spent walking from baseline to post-program, and eight maintained or increased their time spent walking from post-program to six weeks post program. While the biggest change was seen between baseline to post program, improvements in mental health symptoms and total time spent engaging in MVPA were maintained at 6-weeks post program.

Table 4 Summary of Short-term Effectiveness Outcomes (baseline to 6-week follow up)

Variable	Baseline Mean (n=16)	Baseline SD (n=16)	Post-program Mean (n=11)	Post-Program SD (n=11)	6-week follow up Mean (n=11)	6-week follow up SD (n=11)
PHQ-9	10.6	5.34	5.27	3.17	6.27	4.41
GAD-7	10.13	4.77	6.09	4.16	6.64	5.28
FS	37.94	8.53	43.00	4.63	41.27	7.39

Table 5 Summary of Short-term Changes in PA (baseline to 6-week follow up)

Variable	Baseline Mean (min) (n=16)	Baseline SD (n=16)	Post-program Mean (min) (n=11)	Post-Program SD (n=11)	6-week follow up Mean (n=11)	6-week follow up SD (n=11)
IPAQ-SF MVPA min/wk.	95	151.14	246	204.35	158.18	152.20
IPAQ-SF walking min/wk.	265	172.79	311	134.81	280.45	115.61

5.2.2 Perceived program effects

The perceived effectiveness of MIM for students' mental health was explored through interviews with students at the program's completion. Four themes highlight students perceived program effects: 1) improved mental health, 2) reframing the narrative to exercise, 3) improved fitness and PA, and 4) confounding factors.

Improved Mental Health

All students directly mentioned that MIM was helpful for their mental health through providing a sense of accomplishment, a distraction from schoolwork, improving self-confidence, increasing mental clarity, increasing productivity in school, increasing energy, and influencing other lifestyle choices such as eating healthier and sleeping more.

> "Even just the energy! ... Yeah, I found myself sleeping a lot better. I wasn't wanting to sit around as much. I actually started eating a lot better because I realized if I eat, you know, instant ramen every day and then go to the gym I'm not going to feel as good as if I'm actually taking care and having a balanced diet. So, I was … impressed just how

> multifaceted it was that I didn't only see changes in my body and self-confidence, but also just mental health and physical health as a whole." (SP9)

Reframing the narrative to exercise

Notably, half of the students described how MIM helped reframe the narrative they had about exercise. Based on their experience of MIM they now considered exercise to be a tool to support their mental health and help them to boost their mood, rather than only being a tool for physical fitness. This touches on one of the key goals of MIM to enable students to take control of their own health and increase their toolkit for supporting their own wellbeing.

> "I think the biggest for me was instead of kind of exercising for how I looked, like trying to, like look a certain way… the environment helps me kind of reframe my mindset towards exercise. I kind of look at it now more so as a thing that benefits my overall well-being and it's not something I'm like, trying to, you know, fit into a size two dress or whatever. It's more so like, I'm wanting to get stronger. I'm excited to run further a bit faster. It's a healthier relationship to exercise and to my body" (SP2)

Improved Fitness and PA

In addition to mental health improvements, students also mentioned changes in physical fitness and overall, PA levels which impacted their overall wellbeing. Most students reported that MIM was effective at improving their physical fitness. One student mentioned that having MIM increased their PA levels not only in the sessions, but through walking to the gym for their sessions. These sessions were a reason to leave the house, which also contributed to increased mood and overall wellbeing. This is consistent with the self-report PA data collected, reporting that student's overall levels of MVPA and time spent walking increased (section 5.2.1).

Confounding Factors

Two students mentioned that the effectiveness of MIM as a treatment option could have been impacted by other factors such as changing prescription medication, or the change in

seasons and seasonal depressive symptoms. Therefore, they could not necessarily attribute the positive changes in their mental well-being to MIM alone.

> "Right after each session my energy went up and I was pretty feeling more positive. And I think sort of the long term was an overall sort of boost in mental health. I mean, I did also change my medication around the time I started so that could have it could have been either medication or the gym, so I don't really know. But yeah, just overall feeling a bit better." (SP7)

Effectiveness was not directly measured or explored through the CS or EP staff. However, one CS staff member mentioned a student returning to CS after MIM. The student continued to seek help from CS for seasonal symptoms following MIM, although reported to be continuing to exercise to mitigate symptom severity.

> "The student also was presenting with seasonal affective disorder. So, I think that was playing a role in terms of some of their presentation given that even though it was January, they did find that exercise was supportive but there was still that chronological kind of issue... I just did a follow up with them, because I was still trying to see if their symptoms are getting worse, and I was going to maybe refer them to something else. But exercise was a goal that they made in that time period. So, I saw them in January and then I think I saw about a month and a half later… and they were still engaging in exercise. So, there was some, I mean, it's very informal feedback to everything, but they were doing exercises kind of as a treatment for some of their symptoms." (CS1).

This quote touches on the effectiveness of MIM to achieve its desired outcome to improve mental health symptoms of post-secondary students, and to provide a treatment option that is best for them. Although the student continued to seek health care from CS, they also continued to use exercise as an effective strategy to manage their mental health symptoms. This was one of the key intentions of MIM, to build students competency and autonomy to continue engaging in exercise post-program to support their mental health.

5.3 Adoption

5.3.1 Adoption of referrals by counselling staff

Adoption at the setting level was represented as the number of CS staff referring to the program. Out of the 36 CS staff members available to refer, 10 (27.8%) sent referrals. Table 7 breaks down the number of referrals from each department within Counselling Services to represent adoption across different offices and professional designations on campus. This is presented by the number of referral agents, and referrals, received from mental health providers located in the main Counselling Services building on campus (40%), from embedded counselling sites across campus (40%) (i.e. Sauder business school, faculty of education), as well as wellness advisors (10%). CS has counsellors across campus, wellness advisors, as well as staff 'embedded' in several faculties across UBC. A Wellness Advisor acts as the first point of contact for students at CS and helps to direct and refer students to their best treatment option based on an initial intake assessment. An Embedded Counsellor is available to students seeking tailored wellbeing support targeted towards frequent concerns within their faculty. As seen in Table 7, embedded counsellors were the main driver of referrals for MIM. It is possible that certain faculties on campus may be best suited to MIM for wellbeing support. Or, that specific CS staff embedded into faculties adopted MIM more readily than staff at other CS support locations across campus.

Table 6 Summary of Adoption of Referral Agents within Counselling Services Departments

Referring Counselling staff role	**Mental health provider**	**Mental health provider- embedded**	**Wellness advisor**
Number of referral agents (potential 36 CS staff to refer)	4	4	2
Number of referrals	6	10	5

5.3.2 Adoption and acceptability of referrals by potential referral agents

Interviews with CS staff were conducted to examine the extent to which the referral strategy in this program was considered acceptable, and if it was widely adopted by all potential referral agents. Before examining the acceptability and adoption of MIM, interviews with CS staff first explored what a typical day looks like for staff. CS staff who participated in an interview reported to meet with 4-8 students per day along with engaging in outreach work on campus, staff and faculty consultations, and additional administration work. CS staff mentioned that they have limited time between student consultations and depending on their role on campus may only meet with a student 1-2 times in total before they are referred to other resources based on the stepped care model. CS staff who participated in an interview sent 0-5 referrals each. This, in comparison to the total number of students they work with per day (4-8 students, 5 days a week, during a 6-month window of recruitment for referrals to MIM) reflects a very low adoption rate.

Collectively, CS staff interviewed reported to have spoken about MIM to very few students throughout the year. One CS staff member recalled speaking about MIM to less than 10% of students they worked with, and another, less than 10 students' total. This indicates that despite potential acceptance of MIM by CS staff, it was not adopted or spoken about frequently by CS staff and students seeking help with depression. Of the five CS staff who were interviewed post-program, the acceptability of the current referral strategy and reasons, for or against, referring students to MIM can be represented in two themes: 1) CS Buy-in, and 2) Fit with the Stepped Care Model.

CS Buy-In

The extent that the referral strategy in this program was acceptable, and adopted by all potential CS staff was influenced by the amount that CS staff 'bought-in' to the program. Buy-in was reflected through CS believing in the benefit of MIM on campus and advocating for it when speaking to students, their praise of MIM, and seeing its fit within the other CS programs, and through having full support from the directors of CS. CS staff 'buying-in' to the program facilitates some aspect of engagement with speaking about MIM to students and potentially sending referrals.

> "I think it's [exercise] a holistic way of looking at health and mental health. So totally fits... I think it [MIM] just eliminates such a barrier because I think often when people are depressed or anxious and they're advised to do exercise as a form of like evidence-based treatment that can feel really hollow. You know, that's difficult for someone to actually enact because it's a fairly big task. And so having this program to facilitate that transition into that kind of work, or like, you know, make it accessible in that kind of way." (CS4)

A key aspect of CS accepting and buying in to MIM was their belief in using exercise as a tool to improve mental health symptoms. All the interviewed CS staff strongly vouched for their belief in exercise.

> "Exercise has supportive benefit for mental health just kind of as a panacea [antidepressant medication] does… I do think it's quite valuable having… just in terms of providing an additional adjunct of therapy on campus, rather than just psychotherapy, I think it's great to have this supportive element that that's utilizing." (CS1)

Further, most mentioned that they themselves regularly engage in their own exercise routine for self-care. It is possible that there is a link between CS staff who accept MIM who also regularly engage in PA and exercise themselves.

> "I personally, like in my own life, value physical activity. So, I think we can speak to students about a research project that you genuinely are enthusiastic about in terms of the origins of it and the goals of it. I think it can motivate students." (CS3)

Beyond belief in using exercise for symptoms of depression, most CS staff mentioned that their confidence in the integrity and effectiveness of the program was one aspect that influenced their acceptance and adoption of MIM.

> "I feel very confident referring the students or I didn't have any doubt that, you know, this wasn't a good match, or that they were a bad hands or something like that in any setting" (CS1)

Further, CS staff mentioned that several aspects of the MIM program design encouraged acceptance and adoption of referrals amongst their team. Key features such as ensuring confidentiality of students, sending patient updates from EPs back to CS, and following the CANMAT guidelines for exercise and depression instilled confidence for CS staff to accept MIM as a new treatment option within CS.

Fit with the stepped care model

The interviewed CS staff also reported a fit of the program with UBC's stepped care model for providing mental health care to students. Firstly, all CS staff identified that enquiring about a student's current level of exercise is a routine aspect of their patient screening. Further, this aspect of screening aided in the acceptance and adoption of considering MIM in routine screening as exercise was already being discussed as a self-care tool. The screening process helped CS staff to identify if a student may or may not be a good fit for MIM.

> "Folks are trained to assess like lifestyle factors and how they're impacting well-being and get sort of a snapshot of how someone is functioning in their day to day. And so, the typical markers that they would be asking about would be sleep, diet, exercise, and social support systems... But we do have templates for any intakes with students, that would also prompt our practitioners to be asking about those things which include exercise." (CS5)

Beyond the current patient screening procedures at CS, most CS staff identified that MIM has a clear fit with the stepped care model that CS follows on campus.

> "I think it fits in with a stepped care model. So for example, if a student has been working with me on with in short term counseling around, you know, managing anxiety, and we've gotten to a place where we've done some CBT and they feel like they've got a pretty good handle on that but they'd like to be able to explore other ways to manage or maintain their anxiety, I would completely promote exercise. And I could see that as just being another treatment option, like ending our working time together, and then kind of moving them on to another service that can help support them to meeting their goals." (CS3)

Another CS staff member identified MIM to be a perfect option for the stepped care model as it provides a less intrusive treatment option.

> "Because we were within the stepped care on campus, we're always looking for the least intrusive and most effective referral. And so, if a student is meeting criteria for your program, you know experiencing depressive cycle, I think it's a perfect option." (CS5)

Despite clear themes of acceptance of MIM by the CS staff who participated in an interview, there was a low adoption rate with very few referrals generated from CS staff. The barriers and facilitators CS staff identified to send a referral are presented in section 5.4.1-2.

5.4 Implementation

Two areas of implementation were explored, 1) the referral pathway implementation, and 2) the exercise program implementation. This chapter explores the facilitators and barriers to the implementation of MIM, and the extent of implementation fidelity. This helps us to understand the effectiveness of the implementation of MIM, and why, or why not, the program was successful. For example, what factors influenced the number of referrals that were received?

5.4.1 Facilitators and Barriers to Implementation

5.4.1.1 Referral pathway implementation

5.4.1.1.1 Facilitators

Beyond the adoption and acceptance of MIM as a treatment option (see section 5.3), facilitating themes to implementing MIM included 1) changing the PHQ-9 eligibility criteria, 2)

MIM being a free treatment option, and 3) keeping the program at the top of their minds to refer students.

Changing the PHQ-9 Eligibility

All CS staff identified that changing the PHQ-9 eligibility halfway through the school year from 10-19 (moderate depression) to 5-19 (mild-moderate) increased the number of students eligible for the program and therefore facilitated an influx of referrals after the change.

> "I think initially, I recall, there was a bit of a challenge because if students were presenting with a higher PHQ … Their motivation was quite low, and they weren't that interested in the program. Or also because it's higher PHQ… sometimes they would need like, a bunch of other care as well. So, it felt like kind of an overwhelming number of [treatment] options… I do think like a low to medium is kind of the sweet spot where it's like people are impacted, but they still have enough kind of energy to get themselves out there" (CS4)

Free Treatment Option

Most CS mentioned that the fact that MIM was free was a facilitator to the implementation of the program and enrolling students. When speaking to students about the program, CS staff mentioned they promoted it as free personal training for mental health.

> "As well when we think about health equity, I think it offers an option for those who would not otherwise be able to access physical activity in a really structured and supported way. So, I think that's kind of one of its blessings or its gifts that it brings to campus."(CS3).

Top of Mind

All CS staff highlighted the importance of keeping the option to refer to MIM at the top of their mind to facilitate referrals to the program. This was done through consistent email reminders and updates of program capacity, staff training, and having posters up in CS locations. All mentioned that they have a lot of programs to keep track of so if it was not at the top of their mind it was less likely that they would refer.

> "I think in terms of reminders … probably a thoughtful thing on your side of things that kind of re-reignite that in our minds because certainly as the semester goes on there's just so many things to kind of keep track of. Especially in our roles because we're seeing quite a bit of students and just on a daily basis. So, I think having those kinds of reminders, it's good to kind of refresh that." (CS1)

5.4.1.1.2 Barriers

There were three barriers for CS staff in implementing this new referral into their practice. These barriers were: 1) the eligibility criteria, 2) the referral process, and 3) the timing of staff training.

The Eligibility Criteria

CS staff identified that the eligibility criteria was a barrier for a few students to be enrolled who would have benefited from MIM. This included the student's level of current physical activity if they were already exercising >3 times per week, as well as having anxiety as the primary presenting concern rather than depression.

The Referral Process

CS staff felt the referral process could be more streamlined into other referral processes as its current format took more time and effort than needed. CS staff have limited time and reported that the current process had too many steps by filling out the form, saving it in a folder, and having an admin staff send it to BodyWorks. These steps did not fit smoothly into their allocated time between student appointments.

> "I think for a lot of folks, it's like they want things like paperwork like referrals to be done like quickly and easily, you know, where it's like, doesn't require a ton of like time or effort to be able to do" (CS2)

Staff Training Timing

Lastly, they mentioned that the timing of the CS staff training on MIM is important to keep the program at the top of their mind. Having the staff training in September at the start of the school year proved to be a barrier to referrals as CS did not have enough time to dedicate to discussion of MIM. With little time, not all information about MIM was communicated that needed to be at the start of the year.

> "I think it's maybe a timing when it came out in terms of introduction to the team, I think, not that there was a bad time… It felt like a busy time the semester. I think that it was maybe an adjustment piece, us as clinicians in referring could have made a big difference if we had learned about the program at a different time..." (CS1)

5.4.1.2 Exercise Program Implementation

5.4.1.2.1 Facilitators

There were two themes concerning implementation facilitators for EPs including 1) EPs competence, and 2) the relationship between program partners.

EPs Competence

Collectively the EPs interviewed reported that they felt prepared, qualified, and competent in their ability to deliver this program based on their previous education and current training for MIM. Specifically, the additional training on mental health literacy from CSEP helped them to navigate conversations about mental health with the participants. This perceived competency may have facilitated the quality of intervention delivery described by SPs.

Relationship of Program Partners

Secondly, EPs identified that relationships between CS and Bodyworks, CS and Pop-PA, and Pop-PA lab to Bodyworks to be an important facilitator of implementation. There is a needed

connection between all groups involved to build rapport, facilitate referrals, and trouble-shoot when concerns in the program arose.

> “it's important that you guys [the research team] are available to troubleshoot when we do get some information on a referral or in our first meeting with somebody like we suspect that there might be other things going on that might make the person ineligible, or this program a bad idea for them. It's just important that we have that rapport, and we can go back and forth that discuss that” (EP5)

5.4.1.2.2 Barriers

EPs described one barrier to the implementation of MIM.

Lack of Student Accountability

EPs identified that a lack of accountability for students to book their own appointments at Bodyworks presented as a barrier to them attending all 12 sessions and completing the program in a timely manner. BodyWorks staff elaborated that often students would leave their exercise session without having their next visit booked. Students frequently worked with different EPs throughout the program, resulting in a lack of accountability to booking their next session in. For some SPs they noticed that if there were not external reminders from the BodyWorks staff to book their next session, the SP would forget or put off booking in. Allowing the students to have full independence in booking twice a week for their exercise sessions may have played a role in 4/16 students not finishing their 12 sessions before MIM closed for the year, and 3/16 students dropping out (see Appendix K and L).

> "I think that we were missing something that worked previously… I think it was good to try promoting the agency and themselves [participants] having the independence and the power to book their own sessions. We had this structured process of following up with them in case they didn't do that. But there was a lot of them not doing that and US following up." (EP5).

5.4.2 Implementation Fidelity

Next, I explore the perspectives of SPs, EPs and CS staff to explore the extent that the key aspects of MIM delivered as intended.

5.4.2.1 Student Attendance

Attendance to the program by SPs was included as measure of whether MIM was implemented as intended. Of the 16 students who enrolled in MIM, 9 completed all 12 sessions, 4 were enrolled but did not complete 12 sessions before the program end date, and 3 dropped out. For those who completed all 12 sessions, the average time to complete the program was 9.5 (n=9) weeks, which falls above the intended implementation of 12 semi-private exercise sessions completed within 6-9 weeks. There were varying reasons why students were unable to complete 12 sessions within 6-9 weeks including semester breaks (Easter and Christmas), conflicting course and exam schedules, injury or illness, poor mental health days, or lack of initiative to book sessions. These reasons were recorded by BodyWorks staff along with attendance records, see Appendix K.

5.4.2.2 Referral pathway implementation

The implementation of the referral pathway from Counselling Services to BodyWorks had several barriers and facilitators as discussed in section 5.4.1. Due to these factors, the referral process seemed to be delivered as intended, but not at the quantity of referrals that was expected (low adoption rate, see 5.3). Several suggestions were suggested by CS on how to improve the process of sending a referral listed in section 5.5.3.2. By improving the implementation of the referral pathway in the future MIM may generate more referrals and students enrolling into the program.

5.4.2.3 Exercise program implementation

The extent that MIM was implemented as intended was explored through interviews with EPs, SPs, and CS staff. Questions covered aspects of the program design including 1) the time to enroll in MIM, 2) adherence to 2 exercise sessions per week, 3) adherence to one self-guided session per week, 4) individualized exercise programming, and 5) if and how the program satisfied the psychological needs of competence, autonomy and relatedness (SDT; Ryan & Deci, 2017).

Time to Enroll in MIM

MIM was designed to have students enrolled within one week of referral. Students reported that their time to enrol from Counselling Services to beginning MIM was 1-3 weeks. For two students, they had to wait until the next academic semester due to scheduling conflicts. Three students reported that the delay in enrollment was because of their own time it took to respond to emails. Most students mentioned that the enrollment process was easy for them compared to some other UBC programs. One student mentioned that the few weeks between referral and enrollment could be discouraging for students who are interested in MIM.

> "I think the referral experience was definitely good… I think it was all handled really well. Like people from the BodyWorks program are very, very communicative. So, it was easy to like, plan and pick time. So yeah, I think it went very smoothly." (SP4)

Adherence to 2 sessions per week

The frequency that students attended two sessions a week at Bodyworks as designed is a measure of whether MIM was implemented as intended and the intervention dosage received. Most students mentioned that they were able to attend twice per week except for school semester breaks and holidays, school exam periods, or the occurrence of illness.

Adherence to one self-guided session per week

Most students mentioned that they were encouraged to participate in an additional, self-guided 3rd session per week by their EPs, and all reported achieving this goal most weeks including activities such as: running, yoga, dance class, visiting a gym facility, walking, and running on a local track. Energy, time management, and exam schedules were all reasons that students provided if they were not able to complete a third session on their own. One student mentioned that they were encouraged to do small bouts of activity in ten-minute intervals as they were not able to schedule a third session in their workday.

Two EPs delivering the intervention reported that most SPs they worked with reported engaging in a 3rd, self-guided session each week. As well, EPs described discussing this with SPs weekly as intended in the program design.

Individualized program

The intention of MIM was to provide 6-weeks of personal training, two sessions a week, with exercise programming being individualized and tailored based on the student's preferences and goals. Therefore, exploring whether EPs felt the program was individualized for participants was considered a measure of implementation fidelity. Two EPs felt that the program was tailored towards the student's goals and gave the students an opportunity to progress and learn new skills based on their interests.

> "So typically, what would happen is at the fitness assessment, we would curate the program. So, whoever did that fitness assessment, we're kind of right at the program. So, depending on if it was strength, aerobic, or like a mixed program, obviously, we tailored it. But generally, it would look like two kind of main resistance exercises, two supporting resistance exercises, and then moving into the aerobic. And what I would do is I would, if they'd only been once or twice before I would leave the exercises as they are. But then later on I would kind of check and say, oh, how are you feeling about these exercises? Do you want to change them? Anything? You're not liking anything that you'd like to progress to or try?" (EP1)

From program participants, most students felt that the program had been individualized towards their goals and interests.

> "They had a ton of variety of not only exercises, but machines as well. So, they really walk you through, what do you like, what do you not like, and they were never forcing you to do things you don't like… this was very much like, if you don't like it, we're going to figure out something that works for you because this is meant to be positive" (SP9)

Self Determination Theory

Informed by Self-Determination Theory (Ryan & Deci, 2017), MIM was designed to be an enjoyable treatment option for students which boosts autonomy, competency and relatedness. EPs delivering the intervention reported that students 'raved' about being a part of MIM and always gave positive feedback.

> "I think just hearing from some of the regulars, every session, they would say to me, I'm so happy I'm doing this. And they would just go on about how good of a program it was for them. So that to me, just, it felt like it really made a difference to them." (EP1).

Autonomy

The extent that students perceived the program to be autonomy-supportive was an indicator as to whether MIM was delivered as intended. Most SPs felt that they had a sense of choice in the exercises they participated in throughout the program, as well as in the overall program design. Some students mentioned that participating in this program gave them an increased sense of control over their own life and health.

> "So, I think, again, even just offering this in the first place for people to see themselves in an environment they maybe haven't, and give themselves the chance to improve mentally, physically, emotionally. You know, you're kind of giving them that control and giving them their life back." (SP9)

Competency

The extent that students were able to build perceived competence in engaging in self-managed exercise was also a measure of whether MIM was delivered as intended. Did the participants have an increased sense of confidence in their skills and abilities after the program completion? Through observation, one EP reported that several participants they worked with had plans to exercise after the program. Another EP mentioned that there were mixed outcomes, but that most students seemed sufficiently confident to try exercising on their own afterwards. One SP reported that they were not self-motivated to go on their own but had learned some skills on how to do so if they were to attend a gym facility. All other students mentioned that their confidence to exercise on their own had improved, and that they felt competent in using gym equipment after MIM.

> "Honestly, I definitely feel way more confident. Like… I didn't know how to lift any sort of weights and especially things like using a squat rack and putting weights on to the bar. I've never really done that before...I was actually surprised with how much it was helping in such a short period of time. And like, even when I look like back to the start, like, the amount of like confidence that I have kind of in my physical ability has gone up immensely." (SP4)

Relatedness

Finally, did the students experience a sense of belonging and connection to others through this program? EPs did not see SPs engaging with each other, although there was constant interaction between the EPs and SPs. This may be one missing intended outcome from the program design.

> "In all of my sessions, where I did, like, introduce them just so that they could each other and be like, Hey, guys, you are both in Mind in Motion, just introduce them to each other. But then after that they like, wouldn't really engage with each other" (EP2)

However, most students reported feeling a sense of relatedness to the EPs, mentioning that they felt like friends, and that it felt like a community at BodyWorks.

> "And just having like people to talk to as well. So, whether it was the trainers or the other participants, so you had that little community there." (SP13)

Several SPs said that they were unsure if they should interact with other participants in MIM and only engaged in small talk.

> "Just because of the nature of the program... It's kind of like a sticky area where you're like, ah… Do you want me to talk to you? Or like, no, you do not want it? Yeah, but I think it would be good if more people did talk and supported each other" (SP4)

One student mentioned that they felt a sense of belonging knowing that the other people in the gym were there for the same reasons in supporting their mental health.

> "Especially knowing that everybody was there for MIM when I was doing it. It just kind of felt like okay, these are people like me, I see myself here. You know, if it was just me being MIM, and then everybody else was maybe like, I don't know, part of the football team, I would feel like the odd man out, but it kind of felt like… somebody like me is here. You know, I'm welcome here." (SP9)

5.5 Maintenance

Due to the timeline of the implementation of MIM, this evaluation does not directly measure maintenance at an individual level (student symptom outcomes) or setting level (long-term implementation) for >6 months. Instead, within the timeline of this evaluation, targeted program outcomes were measured 6-weeks post program (see section 5.2.1). One aspect of maintenance at the individual level could be students' intention to continue exercising after MIM. When discussing future plans to exercise after MIM, two students reported feeling hesitant to attend a gym facility on their own and were unsure of how they might continue exercising. All other students had clear plans to continue including playing on a hockey team (1), attending an on/off campus gym (5), dance classes (1), personal training (1), yoga (1), running (3), and at

home workouts (1). One student even signed up for a 10km road race after the program's completion.

Setting level maintenance was explored through interviews with EPs and CPs to understand their perceptions of, and expectations for, MIM's sustainability. This included questions on what the perceived facilitators and barriers could be to maintaining the MIM program long term.

5.5.1 Facilitators to sustainability of MIM on campus

Interviews were used to understand perceived facilitators to the long- term sustainability of MIM. Facilitators identified include: 1) need for programming, 2) future buy-in, and 3) the familiarity of program partners.

Need for Programming

The first facilitator identified by both EPs and CS is that there remains a need for programming such as MIM on campus. Collectively, CS staff and EPs felt that there is a demand for a variety of programs to meet the needs of a diverse presentation of student mental health symptoms and treatment interests. The need for a variety of treatment options facilitates the sustainability and potential fit for MIM on campus in the future.

Future Buy-In

Further, a facilitator to the maintenance of MIM on campus is the future buy-in from CS staff to continue implementing the program in the upcoming years. All CS staff mentioned the desire to have this as a treatment option for students in the future and indicated an intention to continue to refer in the future. CS staff felt that it matches the mission on campus to meet students with the best treatment option for them within the stepped care model.

> "I think having more options for interventions is key for our students because of the varying kind of population that we have on campus. There is so much difference in terms

> of clinical presentations here on campus from symptoms and demographics. So, I think having more options for students is important because it's reflective of the community that's here and present." (CS1)

Familiarity of Program Partners

Familiarity with MIM was mentioned as a facilitator from both CS and EPs. Several CS staff mention that the sustainability of MIM on campus relies on the familiarity of the CS team with the program. The more familiar CS staff become with MIM over time, the more referrals will be generated, and the more students will be able to access the program.

> "I'm just excited that it [MIM] exists and hope that it gets more opportunity to just like take off because it almost feels like something that once like maybe word of mouth kind of comes around or like, things are finessed… It just feels like it'll be such a successful program." (CS4)

From the EPs, BodyWorks staff in the upcoming year will have more availability and experience having already worked in MIM. This familiarity with the program may facilitate higher quality implementation in the future and may assist in the comfort and enjoyment of SPs in the program.

5.5.2 Barriers to sustainability of MIM on campus

Interviews with EPs and CS staff were used to understand expected barriers to the long-term sustainability of program. Interviews with CS staff did not highlight barriers to the sustainability of MIM from the CS side of the program. EPs mentioned various barriers to the sustainability of MIM on campus including 1) concerns about future costs and funding for the program, 2) logistic concerns of scheduling multiple programs at the gym facility, and 3) trainer availability. Most importantly, EPs felt that the current design was not feasible to organize staff and gym space long-term and that shifting to group training could eliminate the various barriers identified here. This is further discussed in section 5.5.3.

5.5.3 Suggestions for the sustainability of MIM

Lastly, when discussing the potential sustainability of MIM on campus, suggestions to improve MIM were recorded from SPs, EPs and CS staff. Suggestions were made for 1) the referral process, and 2) the program design.

5.5.3.1 Changes to the referral process

To increase enrollment, SPs, EPs and CS staff collectively suggested to change the referral strategy to include self-referrals, to simplify the referral process from CS, to extend the locations on campus which can send referrals such as including Student Health Services or the Centre for Accessibility, as well as to promote the program through email newsletters, booths, and posters. These are summarized in Table 7.

Table 7 Summary of Suggested Changes to the Referral Process

Suggested Change	Description	Sample Quote
Self-referral	Most CS staff, EPs and SPs suggested including a self-referral option for students to enrol in MIM in future years. A self-referral option could be useful in various scenarios. First, when the counsellor is speaking to the student, and they are interested but would like some time to think about it. The counsellor could then provide a referral card with a QR code for the student to self-refer later. This fosters some independence in the student. Second, a self-referral option could remove the barrier of a student then needing to book an appointment at CS for a referral to BodyWorks.	"To be fair, like being in like a stepped care process we're wanting students to be able to like access resources without necessarily having to be connected to a counselor because sometimes a student will come and then that's [MIM] all they're wanting. And it's like, well, they could have that could have been an appointment spot for somebody else." (CS2)
Simplified referral from CS	Both CS staff and EPs suggested changing the process between CS and BodyWorks to be more time efficient and streamlined into current referral practices among the CS team. This could be done by shortening the referral form or switching to an in-house EMR system rather than electronic fax.	"If I could just send some kind of like cryptic email directed to a particular email [at BodyWorks] directly. Because I know that for myself you fill out the [referral] form, which is fine and then it's like these like little steps of like… I have to save it somewhere, message my front desk, wait for my front desk to know if it would be accepted or not. Some of them will respond back to me, some of them don't… It just ended up being more work in a way." (CS2)
Expanding referring practitioners	Most CS staff, EPs, and SPs mentioned including practitioners from student health services (i.e. GP and psychiatry practitioners) to be able to send referrals.	"Campus Health, for sure, as they might be getting a lot of people that are maybe not seeking counseling yet. But they have other things that are popping up, they're getting sick frequently, maybe they're able to get to see a physician, a family doctor or nurse practitioner there. But they aren't able to, or they aren't ready to see counseling." (EP5).
Increased promotion on campus	Most CS staff, EPs, and SPs suggested more promotion of MIM to the student body through campus club days, information booths, flyers and posters on campus, and disseminating information on social media.	"Maybe it's kind of looking at, how do you expand the accessibility? Does it always require a referral through a mental health provider? Or are there other kinds of entry points for students? Can there be referrals made you know, from our physicians or self-referrals? How do you open the accessibility without, I guess, flooding accessibility?" (CS5)

5.5.3.2 Changes to Program Design

Several suggestions to improve the design of MIM were given including shifting to group training, changing the program duration, creating a bridging program, including anxiety in the referral criteria, and to provide additional resources for students. Suggestions for designing the staff training with CS and BodyWorks were offered. These are summarized in Table 8. The results and suggestions from this program evaluation are discussed in Chapter 6 for future research and program implementation. Additionally, an infographic was created to share the results of this program evaluation with the MIM program partners at BodyWorks and CS, see Appendix K.

Table 8 Summary of Suggested Changes to MIM Program Design

Suggested Change	Description	Sample Quote
Group Training	EPs strongly suggest a shift from semi-private training to group training to accommodate for increased volume of student enrollments, staffing, scheduling, and cost of the program. Students had mixed feedback preferring private or semi-private training. For group size, most SPs said a range of 1-8 people would be acceptable.	"I think probably anything over like four or five (in a group), would be too much. And the reason I say that is because I do think like, my favorite part of the program was being able to talk with the instructors and like, have personalized feedback on what I'm doing, like on a very regular interval… and I think the feedback is important, because, like I said, it helps to build confidence." (SP4)
Program Duration	SPs and EPs mentioned that breaks between academic semesters interrupted their time in MIM and suggested that the program ends with the academic term. CS staff suggested offering MIM throughout the summer as well.	"Because we're always going to have these breaks in programming around the ends of the term. So, I just think it would be too bad if we were getting people in a few weeks before that break that we have this long break that kills our momentum and then we have to try to get up and going again." (EP5)
Bridging Program	Most EPs and SPs suggested developing a bridging program to help students transition to self-managed exercise after MIM. This would help boost student competency in exercising in environments outside of BodyWorks after the completion of MIM.	"I would say this is a good kind of intro and I think it could help people kind of get over some of the intimidation to start working out. The other side of things that I would maybe say is that coming into our gym and going into a commercial gym are very different environments. So maybe…don't know how feasible it would be for a trainer to join them a different gym sort of thing." (EP1)
Student Eligibility	Most CS staff strongly suggest that future iterations of MIM act as a treatment option for students with symptoms anxiety as well as depression.	"I feel quite strongly like, if you were to open it up to anxiety, you would see a huge inpour of students… it would open up a huge amount of students that would really benefit from Mind in Motion" (CS2)

Staff Training	EPs suggested to improve their staff training by having an additional staff training at the start of the second school semester and focusing training days practical activities. As most EP staff are relatively new to personal training having time to practice delivering exercise programming or practicing speaking to improve mental health literacy would be a more useful way to use the time. CS staff suggested: 1) holding staff meetings before the school year starts while their team is less busy, 2) having a representative EP at the meeting to build rapport between community partners, 3) to provide short talking points on how to discuss MIM with students, and 4) to hold second meeting throughout the school year can help remind CS staff about the program and increase familiarity.	“But also, in terms of getting some information from the [BodyWorks team member] that was helpful … giving some information about what the space was like. I think that would have been really helpful [at the] beginning [of the school year] because then that also helped me to kind of have the conversation with students in terms of like, selling the space or selling what's going on there... that kind of extra contextual information helps… support them to help the student feel more confident because then I'm more confident about what's going on too!" (CS1)
Resources for SPs	SPs suggested providing more resources to support their mental health and behaviour change throughout such as a journal to work on during the program, education on holistic wellness (mind, body, spirit), and information about other lifestyle habits such as sleep and nutrition.	"I almost wonder if at times it would be good to give people kind of a workout journal to kind of be like… write down one thing that you did that was active outside of these sessions and how long did you do it? How did you feel? Especially because during the activities, they would kind of ask you that intensity level of like zero to 10. I think it would be cool if people kind of kept that scale consistent so that you can kind of be more mindful of it going forward as well of like, okay, am I pushing myself too hard? Am I not pushing myself enough? ... maybe that's self-journaling or even just encouragement of like, here's a sample of how people you know, track their fitness." (SP9)

Chapter 6: Discussion

This program evaluation investigated the effectiveness and implementation of an on-campus evidence-based exercise referral program for post-secondary students with depression. The results of this evaluation demonstrate that MIM participation was associated with reductions in symptoms of depression and anxiety, increases in overall well-being, and increased weekly minutes of self-reported MVPA. Qualitative data suggested that participation was effective in boosting SPs sense of autonomy over their own health, and competency in continuing to engage in self-managed exercise post-program to manage their mental health symptoms. However, adoption rates at CS were low resulting in limited student reach, and ultimately a small recruitment rate of students enrolled into MIM. With limited recruitment, the MIM exercise sessions did not run at planned capacity. Despite this, most aspects of the intervention were delivered as intended and the MIM program partners were supportive in the potential long-term maintenance of this treatment option on campus.

6.1 MIM at the Individual Level

Given that exercise programs have repeatedly been shown to significantly improve depressive symptoms in systematic reviews (Heissel et al., 2023; Singh et al., 2023), it is not surprising that MIM participation was associated with improved SP mental health outcomes. The outcomes from this evaluation replicate a growing body of evidence which demonstrates the effectiveness of exercise-based treatments to support the mental health and overall lifestyle of postsecondary students (Donnelly et al., 2024; Jeftic et al., 2023). Ultimately, the MIM intervention did achieve its intended outcomes to improve students' symptoms of depression and anxiety, improve a sense of overall wellbeing, and increase weekly levels of MVPA. This was a positive outcome for the implementation of MIM at the individual level.

There were several notable outcomes that SP mentioned during interviews. Half of the SPs reported that they now have reframed the narrative they have for exercising. Following participation in MIM, they considered exercise to be a self-help tool to support their mental health and boost their mood, rather than only being a tool for physical fitness. Participants in other exercise interventions like MIM have also described viewing exercise as a self-help strategy to manage their depressive symptoms opposed to a more passive treatment modality such as taking antidepressant medications (DeJonge et al., 2020; Searle et al., 2011). This touches on one of the key goals of MIM to enable students to have a sense of control of their own health and learn tools to support their wellbeing, further supporting the effectiveness of this intervention at the individual level. This new sense of control blends into what was the intended 'spirit of MIM,' self-determination theory (SDT; Ryan & Deci, 2017). Exercise programs that are designed to target individuals' motivation can generate better engagement and enjoyment (Jeftic et al., 2023). Program leaders, like the EPs in MIM, can support motivation by supporting participants basic psychological needs (Ryan & Deci, 2017; Jeftic et al., 2023). All supportive strategies to boost autonomy, competency, and relatedness were emphasized in the MIM follow up interviews by SPs. Competency was supported through recognition of progress, building confidence and independence with exercise equipment, and being challenged over time. Autonomy, through allowing SP to have a choice in the exercise selection and programming. As well, relatedness, where students reported having some sense of connection with their EPs (Jeftic et al., 2023; Ntoumanis et al., 2018). Addressing these psychological needs has been reported to increase participant enjoyment and long-term adherence to exercise (Keeler et al., 2019) following interventions like MIM.

There are several points to note which may influence these results. First, most students referred (n = 13) were receiving another treatment for depression outside of the exercise intervention. It is difficult to tease apart the effects of exercise versus these other treatment modalities. Second, a majority of the sample participated in MIM from winter to spring. It is possible that the change in seasons impacted the improvement of mental health symptoms for some SP who experience seasonal patterns of depressive symptoms. Research suggests that there is a seasonal variation in the severity and need for treatment of depressive symptoms in some individuals (Vigod & Levitt, 2011).

Although the results suggest that MIM was effective at improving individual symptom outcomes, the reach of MIM was limited and the recruitment of students was slow. Reach was limited both in the number of referrals received, as well as the demographic make-up of those referred particularly in terms of ancestry. Those referred and enrolled into MIM mostly identified as white (43.8%), domestic Canadian (62.5%), undergraduate (81.25%), and female (68.8%). This generally reflected the student population seeking mental health support at CS except for ancestry. As reported by CS staff (personal correspondence), between April of 2023- March of 2024, students seeking CS mostly identified as white (24%), and domestic (68%), undergraduate (75%), and female (58%). Future iterations of MIM, and research, should target reaching those on campus who may experience more barriers to seeking mental health care due to stigma, poor mental health literacy, or inaccessibility of services (Dunley & Papadopoulos, 2019; Heissel et al., 2023). For example, stigma about mental illness presents a significant barrier to help-seeking behaviour for men and for students who identify as an ethnic minority group (Dunley & Papadopoulos, 2019). Exercise may be a less stigmatizing option than medication or psychotherapy to those who are hesitant to seek health care or to adhere to other mental health

treatments (Heissel et al., 2023). Strategies to enhance the reach of MIM could target male enrollment in future years to explore the barriers and facilitators to their participation, and associated health outcomes.

Term 2 enrolment increased due to 1) more flexible PHQ-9 eligibility criteria, 2) increased counselling staff familiarity with the program to send referrals, and 3) some students enrolled during T2 who were referred in T1 due to a conflict of course schedules. Allowing referrals of students with more mild-moderate representations of depressive symptoms better reflected the students seeking mental health care on campus (as reported by CS management) and increased the number of referrals. Reach could have also been increased by further promotion on campus to increase student awareness of this treatment opportunity (Donnelly et al., 2024). Most interview participants suggested further promotion of MIM to the student body through campus club days, information booths, flyers and posters on campus, and disseminating information on social media.

Once enrolled, the drop-out rate for SPs was low. SPs reported being motivated to attend based on accountability, their enjoyment of the BodyWorks experience, and MIM having a feasible program design that they could adhere to. These findings are similar to that of Skinner and colleagues who found that their SP engaged in an exercise intervention for mental health based on reasons including understanding and seeing the physical and emotional benefits of participation, having flexible time slots to attend sessions, enjoying the program, and having a sense of autonomy/choice in exercise selection (Skinner et al., 2024).

The results of this evaluation suggest that using CS as the only way to refer students on campus might not reach students who are interested in an exercise-based treatment option.

With this being the only way to recruit students, reach was ultimately reliant on organizational factors.

6.2 MIM at the Organizational Level

The low adoption rate of CS staff sending referrals was an influential factor. The referral strategy was not widely adopted by CS staff despite indication of acceptance of this program as a treatment option for students both by referral agents and management staff at CS. In the implementation of EBT-D, it has been suggested to adopt a whole campus approach in the design and delivery of the program to ensure engagement of key on-campus end-users such as students, medical staff, and research experts (Jeftic et al., 2023). However, how to successfully integrate a referral pathway between mental health providers and exercise professionals remains unclear. Only those who referred students volunteered to participate in an interview to provide feedback on the program. Without the perspectives of those who did not make referrals, reasons for non-referral can only be speculated upon. It is known that the timing of outreach staff training with CS was limited, and suboptimal. Several CS staff members shared that the initial outreach was not at an ideal time of the school semester. The lack of time spent with CS staff during outreach and training could have impacted referral agents' confidence in speaking about MIM with students and initiating a referral. As well, one CS staff member mentioned that the lack of adoption of MIM was consistent with referral patterns to other treatment options available at CS, and that as an organization they are trying to promote more diversity in the programs CS staff are referring students to.

Another possibility is low self-efficacy among CS in discussing exercise as a treatment option with students. A scoping review by Glowacki and colleagues (2019) identified that the most common barriers for health care providers in promoting PA with individuals with mental

illness were a lack of training on how to promote PA, and a belief that those with mental illness could not overcome the barriers to engage in PA (Glowacki et al., 2019). Future training with referral agents should 1) increase the amount of time spent with CS in training to address any concerns with program design (e.g. confidentiality of students), and 2) consider providing tools for support, such as the exercise and depression toolkit which was created to support health care providers in speaking about exercise as a treatment option and/or self-care tool with clients or patients (Glowacki & Faulkner, N.D.).

For those at CS who did refer students to MIM, barriers and facilitators to the implementation of the referral pathway were identified. Unsurprisingly, MIM being a free treatment option facilitated CS staff in discussing the program and making referrals. CS staff requested the referral process be more streamlined with their in-house practices to save time and alleviate the burden of sending a referral. Lastly, all CS staff who volunteered for an interview engaged in regular PA themselves. Another facilitator to send a referral was likely their own engagement and support of regular PA, acting as a role model for participation. This is consistent with evidence supporting that health care providers who are physically active act as positive role models and are more likely to provide PA counselling to their patients (Lobelo & Quevedo, 2016).

Once SPs were referred, evidence indicates the program was implemented as intended by EPs. One area for consideration is building in greater SP accountability in booking their future exercise sessions. Students who did not consistently book their sessions in advance did not finish all 12 sessions within the designed timeframe of 6- 9 weeks. To target attendance rates, improve long term effectiveness outcomes, and overall fidelity to program implementation, the addition of Behaviour Change Techniques (BCT's) embedded into exercise program delivery has been

suggested (DeJong et al., 2021; Jeftic et al., 2023). Future iterations of MIM, and future research, should explore the impact of training EPs in BCTs such as Motivational Interviewing (McFadden et al., 2023), action planning, problem solving, and/or goal setting (Skinner et al., 2024; Cody et al., 2022). Much like physical activity interventions for other populations, supporting behaviour change throughout EBT-D may help SP bridge to long-term behaviour change and self-guided adherence to exercise (Jeftic et al., 2023).

The potential for long term sustainability of MIM on campus is promising. Despite limited adoption of referrals in the pilot year of MIM, CS management and staff strongly support moving forward and are hopeful that referrals will increase with time and familiarity. Further, CS works with a stepped care model and sees a clear fit of MIM with this framework of mental health care for students. Lastly, MIM directly addresses two areas of UBC's Wellbeing Strategic Framework through targeting mental health and resilience and physical activity on campus. Its design contributes to the diversity of community programming on campus, increasing students' mental health literacy, and supports goals of reducing the prevalence of physical inactivity among UBC students (Wellbeing Strategic Framework, n.d.). MIM supports student personal development by enabling students with depression to increase control over their own health, and therefore improve their overall health and wellbeing while also providing an experiential learning opportunity for kinesiology students in delivering the program. This strategic design of MIM which fits both the need for diverse mental health programming in post-secondary institutions (Canadian Association of College & University Student Services and Canadian Mental Health Association, 2013) and UBC's commitment to wellbeing of its students as outlined by the UBC's Wellbeing Strategic Framework (Wellbeing Strategic Framework, n.d.)

and Okanagan Charter (Okanagan Charter, 2015). This alignment strengthens the sustainability of MIM.

6.3 Strengths of Evaluation

This evaluation addresses a gap in the literature by addressing the effectiveness of a program of this kind in a real-world setting, rather than efficacy in a controlled setting (Bird et al., 2019). Research involving the voices of end-users in exercise programs and referral pathways for the treatment of depression is particularly lacking in the existing literature. To my knowledge, this is the first evaluation of an exercise-based treatment for post-secondary mental health which includes the voices of all parties involved, the interventionists referring to the program (CS staff), and delivering the intervention (EPs), and the students participating in the intervention. This helps build upon current literature and expand our understanding of what effective and sustainable exercise programs and referrals look like (Searle et al., 2011, Jeftic et al., 2023). Overall, including the voices of program partners for a more rounded perspective on how the program went and what changes may be necessary for long term sustainability was beneficial (DeJonge et al., 2021; Jeftic et al., 2023).

This evaluation included mixed methodology with semi-structured interviews, attendance records, and self-report surveys. One strength of this methodology is the selection of validated self-reported measures specific to the post-secondary population. Further, the inclusion of qualitative and quantitative measures increases the depth of the data collection, allowing 'full use' of the RE-AIM framework (Holtrop et al., 2018). By comparing results from qualitative and quantitative data this evaluation provides a multifaceted understanding of how the program can be improved in the future. For example, gathering feedback on student's symptom outcomes through interviews helps to provide more depth in understanding intervention effects than

through surveys alone (Kajamaa, Mattick, & de la Croix, 2020). For MIM, combining symptom outcomes with end user perspectives gives feedback on how to overcome specific implementation issues in future years of the program (Holtrop et al., 2018). Notably, there was considerable consonance between qualitative and quantitative sources of data.

6.4 Limitations of Evaluation

There were several limitations in this evaluation of MIM. Firstly, qualitative data collection was limited to the perspectives of those who volunteered to participate in an interview. In this evaluation we were not able to recruit a CS staff member for interview who chose not to send a referral, other than one member of the CS management team. Similarly, we were not able to recruit any students who either were referred but chose not to participate in MIM or who dropped out of MIM. Future research should aim to recruit students and referral agents who do not participate in MIM to gain a more well-rounded understanding of student reach and adoption. This could be addressed in the future by inviting students to participate in feedback surveys/ interviews within counselling services offices (e.g. promote in waiting rooms) to gage interest and student perspectives on participation in MIM. With referral agents, informal conversations may be the best starting point to gage interest and begin to understand barriers from those who decide not to send referrals. Events such as meet & greets between CS, the research team, and EPs could be a place to generate these conversations and build rapport with non-adopters.

A limitation in quantitative data collection in this evaluation is the validity and reliability of the IPAQ-SF and potential need for more reliable PA data, such as device-based measurements of physical activity (e.g., accelerometers). For example, one systematic review reported that the IPAQ-SF typically overestimated physical activity as measured by objective criterion by an average of 84 percent (Lee et al., 2011). Hence, caution is required when using this measure as

an indicator of absolute physical activity. An additional limitation in PA measurements was that we were unable to collect pre-post changes in students' fitness from the initial and post-program fitness assessments. This was due to inconsistencies in the training and assessment protocols delivered by the EPs who conducted these assessments. This weakened confidence from the lead EP in using this data. A measure of changes in physical fitness would have been a useful indication of implementation fidelity in adherence to an exercise program. If students attended the program as planned, it would be assumed this would be reflected in improvements in fitness pre-post. Without a control group it is also not possible to rule out that any improvements measured pre-post in students' mental health symptoms were a result of external factors such as changes in weather, school schedule, or medication. This limits inferences that can be drawn about whether MIM participation caused the improvements in mental health although participants attributed participation as beneficial in the interviews.

Another limitation to data collection in this analysis is the lack of long-term follow-up. Individual level maintenance should be explored in the future to understand the long-term effectiveness of MIM on student symptom outcomes (changes in symptoms of depression, anxiety, overall wellbeing) and changes in exercise 6-12 months after MIM. This evaluation did not include a formal cost analysis although this is possible in the RE-AIM framework (Holtrop et al., 2021). Future evaluation of MIM, and programs of its kind, should include this to compare cost effectiveness between treatment modalities for depression (medication, talk therapy, exercise) and to further understand program feasibility. This could aid in future support and implementation of cost-effective, exercise-based treatments.

Lastly, the qualitative analysis of this evaluation was not guided by a specific model, theory, or additional framework with RE-AIM. The use of a theory or model could help to enhance

generalizability, guide the coding process in analysis, and improve understanding of the research outcomes (Holtrop et al., 2021). RE-AIM is often used alongside additional theories, models or frameworks (TMFs) to increase the understanding of implementation success/ failures (Holtrop et al., 2021; Holtrop, Rabin, & Glasgow., 2018). Future evaluation of MIM could include a combination of TMFs, such as RE-AIM and the Consolidated Framework for Implementation Science (CFIR) (Damschroder et al., 2017; Holtrop, Rabin, & Glasgow., 2018), to understand program implementation and effectiveness.

6.5 Implications

The results of this program evaluation demonstrate the feasibility of establishing an exercise treatment referral program in partnership with counselling services in the postsecondary context, and the effectiveness of exercise in improving SP mental health. From the results of this program evaluation, and the need for programs of this kind at UBC, it is recommended to continue moving forward with MIM on campus. However, long-term sustainability on campus is dependent on improved reach and adoption in future years to increase the number of students able to access this treatment option. Based on the findings of this evaluation, three recommendations should be applied to improve implementation effectiveness.

First, there is a need to increase reach to achieve a baseline intake of students which is satisfactory to justify EP staffing and facility requirements. It is suggested to first focus on outreach and training with CS staff in future years to improve their adoption of this referral strategy. In its next iteration, MIM staff training sessions with CS should focus on increasing staff's familiarity with the program and confidence in sending referrals. Changing the referral process to be streamlined with in-house CS processes is recommended. If possible, the length of the staff training session and time during the academic semester should be considered to ensure

that staff prioritize learning about MIM. Another strategy to increase reach would be to add additional referral pathways to MIM such as having other practitioners refer (i.e. Psychiatrist), and/or adding a self-referral option. Having other practitioners refer from student health services could allow for reach of students who seek health support from other areas on campus aside from CS. Self-referral could reach students who may not be willing to access CS or student health services on campus.

Second, shifting from semi-private exercise sessions to a small group training model was requested by EPs to accommodate staff capacity, to coordinate booking times, and to simplify the enrollment process for students. This may assist in long-term sustainability of MIM by having 'set times' that SPs can book in weekly for support. Caution is given in switching to a group training model as there was mixed feedback from SPs on the acceptability of group classes. Some SPs mentioned that attending group classes could be overwhelming due to symptoms of social anxiety that co-exist with their symptoms of depression. It is recommended to restrict group training to 10 SP or less based on qualitative feedback.

Lastly, future iterations of MIM should fine-tune the design of the exercise intervention. MIM can be developed further by training EPs to deliver the program in the spirit of SDT, and on how to support SPs behaviour change and adherence to the exercise program. More in-depth training on strategies for boosting student's competency, autonomy, and relatedness would strengthen the quality of the exercise intervention (Ryan & Deci, 2017; Jeftic et al., 2023; DeJonge et al., 2021). Additionally, it is recommended to consider training EPs on motivational interviewing techniques in the delivery of the intervention (McFadden et al., 2023), as well as including BCTs that support students' engagement in the program and long-term exercise adherence (Jeftic et al., 2023). In November 2024 CSEP is releasing a 40-hour specialization on

exercise and depression. This could be an option to train EPs further in mental health literacy, supporting SPs basic psychological needs in the spirit of SDT, and in supporting long term behaviour change.

Beyond UBC, this research expands on the current literature about the implementation of exercise-based treatments and referral pathways for depression. This program evaluation provides an example of how to develop on-campus referral pathways between mental health practitioners and EPs for post-secondary students seeking treatment for depression. Lessons learnt from this program implementation may be transferable to other post-secondary campuses specifically, and other healthcare settings in general. The results are most helpful for EPs, and partners (e.g., various health care professionals including mental health counsellors and kinesiologists) involved in exercise referral pathways in mental health care. For EPs, the guidelines for working with people experiencing depression are still new to this field of work. EPs who are looking to work with patients referred via mental health services may benefit from further understanding of patient's perceptions and experiences in detail. For example, it will be beneficial for EPs to review the perspectives of mental health counsellors, how they adapted to the intervention, and how this effected the number of referrals to the program, adherence, and drop-out rates. Identifying the ways in which the program both succeeded and could be improved can help partners implement higher quality interventions in the future. Ultimately, this research adds to the literature examining how exercise may be integrated into mental health care in Canada.

Chapter 7: Conclusion

While reflecting upon the results of this thesis, the outcome that most resonated was how SPs described that MIM reframed the narrative they had about exercise. Based on their experience in MIM they now considered exercise to be a tool to support their mental health, rather than only being a tool for physical fitness. I noted this theme frequently in my reflexive journal across interviews with the SPs, EPs, and CS staff. Reflexively, this is of course influenced by my own personal beliefs, lived experiences, and motivation to work as a researcher and practitioner in the field of Kinesiology. Not unlike exercise interventions for physical health conditions such as Type 1 Diabetes or stroke rehabilitation, exercise for the treatment of depressive symptoms goes beyond physical fitness. As SP2 remarked, it now goes beyond an intention to "fit into a size two dress or whatever." The results of this evaluation suggest that MIM has potential as an effective program for supporting students with depression as part of the stepped care approach adopted by the institutional counselling services. Yet, advocacy and research are needed to improve adoption and reach. -Further, I suggest that research explores how EPs can promote and deliver exercise interventions which fosters this narrative of engaging in exercise as a tool for self-care and overall wellbeing. How can we help more students reframe the narrative?

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Appendices

Appendix A Baseline Survey

Demographics:

Date: _____ ID: _____

1. Age (yrs)*:* _____

2. Gender: How do you describe your gender?

□ Woman
□ Man
□ Transgender woman
□ Transgender man
□ Two-spirit
□ Agender
□ Gender fluid
□ Other (please specify): _____
□ Choose not to answer

3. Race/Ethnicity: Please tell us your ethnic background (select all that apply):

- □ White
- □ South Asian (e.g., India, Pakistan, Bangladesh, Sri Lanka)
- □ East Asian and Southeast (e.g., Thailand, Hong Kong, China, Vietnam, Korea, Philippines)
- □ Middle Eastern or North African (e.g., Iran, Israel, Egypt, Morocco)
- □ African (e.g., Nigeria, Ghana, Ethiopia)
- □ Caribbean
- □ British and/or Irish background (e.g., England, Scotland, Wales, Ireland)
- □ Mediterranean (Italian, French, Spain, Greek)
- □ Eastern European (e.g., Ukraine, Romania) or Russian
- □ Northwestern European (e.g., Sweden, Finland)
- □ Hispanic / Latino/a
- □ First nations (please specify): _____
- □ Métis (please specify): _____
- □ Inuk (Inuit; please specify): _____
- □ Other (please specify): _____
- □ Unknown
- □ Choose not to answer

4. Student status: Are you currently a:

□ Full time student □ Part time student

5. How many courses are you taking this semester? _____

6. Are you an international student?

□ Yes □ No

7. Which of the following best describes your housing situation?

□ I live in a campus residence
□ I live with roommates/friends/partner off-campus
□ I live with family off-campus
□ I live alone off-campus
□ I live in housing associated with a fraternity or sorority
□ Homeless/no fixed address
□ Other

8. In a typical week over the last 30 days, how many hours did you:

Volunteer? _____ hours per week
Work for pay. _____ hours per week

9. Do you currently have proper exercise garments? (I.e. running shoes, comfortable/stretchy shorts, pants, tee shirts, etc.)?

Yes, No

9. Diagnosis and Treatment:

Within the last 12 months, have you been diagnosed or treated by a professional for any of the following:

	No	Yes, diagnosed but not treated	Yes, treated with medication	Yes, treated with psychotherapy	Yes, treated with medication and psychotherapy	Yes, other treatment
Anorexia	☐	☐	☐	☐	☐	☐
Anxiety	☐	☐	☐	☐	☐	☐
Attention Deficit and Hyperactivity Disorder	☐	☐	☐	☐	☐	☐
Bipolar Disorder	☐	☐	☐	☐	☐	☐
Bulimia	☐	☐	☐	☐	☐	☐
Depression	☐	☐	☐	☐	☐	☐
Insomnia	☐	☐	☐	☐	☐	☐
Other sleep disorder	☐	☐	☐	☐	☐	☐
Obsessive compulsive disorder	☐	☐	☐	☐	☐	☐
Panic attacks	☐	☐	☐	☐	☐	☐

Phobia	☐	☐	☐	☐	☐	☐
Schizophrenia	☐	☐	☐	☐	☐	☐
Substance abuse or addiction (alcohol or other drugs)	☐	☐	☐	☐	☐	☐
Other addiction (e.g., gambling, internet, sexual)	☐	☐	☐	☐	☐	☐
Other mental health condition	☐	☐	☐	☐	☐	☐

10. Your physical activity

1a. During the last 7 days, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling,

Think about *only* those physical activities that you did for at least 10 minutes at a time.

_____days per week ☐☐☐

or

0 **none**

1b. How much time in total did you usually spend on one of those days doing vigorous physical activities*?*

_____hours _____minutes

2a. Again, think *only* about those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____days per week ☐☐☐

or

0 **none**

2b. How much time in total did you usually spend on one of those days doing moderate physical activities*?*

_____hours _____minutes

3a. During the last 7 days, on how many days did you **walk** for at least 10 minutes at a time? This includes walking at work and at home, walking to travel from place to place, and any other walking that you did solely for recreation, sport, exercise, or leisure.

_____days per week

or

0 **none**

3b. How much time in total did you usually spend walking on one of those days?

_____hours _____minute

11. Your health

1. Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)
a. little interest or pleasure in doing things.	☐	☐	☐	☐
b. Feeling down, depressed, or hopeless.	☐	☐	☐	☐
c. Trouble falling/staying asleep, sleeping too much.	☐	☐	☐	☐
d. Feeling tired or having little energy.	☐	☐	☐	☐
e. Poor appetite or overeating.	☐	☐	☐	☐
f. Feeling bad about yourself, or that you are a failure, or have let yourself or your family down.	☐	☐	☐	☐
g. Trouble concentrating on things, such as reading the newspaper or watching TV.	☐	☐	☐	☐
h. Moving or speaking so slowly that other people could have noticed. Or the opposite; being so fidgety or restless that you have been moving around more than usual.	☐	☐	☐	☐
i. Thoughts that you would be better off dead or of hurting yourself in some way.	☐	☐	☐	☐

2. If you checked off any problem on this questionnaire so far, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

□ Not difficult at all □ Somewhat difficult □ Very difficult □ Extremely difficult

3. Over the last two weeks, how often have you been bothered by the following problems?

	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)
a. Feeling nervous, anxious, or on edge	□	□	□	□
b. Not being able to stop of control worrying	□	□	□	□
c. Worrying too much about different things	□	□	□	□
d. Trouble relaxing	□	□	□	□
e. Being so restless that it is hard to sit still	□	□	□	□
f. Becoming easily annoyed or irritable	□	□	□	□
g. Feeling afraid, as if something awful might happen	□	□	□	□

4. If you checked any problems, how difficult have they made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all Somewhat difficult Very difficult Extremely

5. Below are 8 statements with which you may agree or disagree. Using the 1–7 scale below, indicate your agreement with each item by indicating that response for each statement.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

____ I lead a purposeful and meaningful life
____ My social relationships are supportive and rewarding
____ I am engaged and interested in my daily activities
____ I actively contribute to the happiness and well-being of others
____ I am competent and capable in the activities that are important to me

____ I am a good person and live a good life
____ I am optimistic about my future
____ People respect me

Appendix B Post Program and 6-Week Follow Up Survey

Your physical activity:

1a. During the last 7 days, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

Think about *only* those physical activities that you did for at least 10 minutes at a time.

_____days per week

or

0 **none**

1b. How much time in total did you usually spend on one of those days doing vigorous physical activities*?*

_____hours _____minutes

2a. Again, think *only* about those physical activities that you did for at least 10 minutes at a time. During the last 7 days, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____days per week

or

0 **none**

2b. How much time in total did you usually spend on one of those days doing moderate physical activities*?*

_____hours _____minutes

3a. During the last 7 days, on how many days did you **walk** for at least 10 minutes at a time? This includes walking at work and at home, walking to travel from place to place, and any other walking that you did solely for recreation, sport, exercise, or leisure.

_____days per week

or

0 **none**

3b. How much time in total did you usually spend walking on one of those days*?*

_____hours _____minutes

Your health:

4. Over the last 2 weeks, how often have you been bothered by any of the following problems?

	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)
a. Little interest or pleasure in doing things.	☐	☐	☐	☐
b. Feeling down, depressed, or hopeless.	☐	☐	☐	☐
c. Trouble falling/staying asleep, sleeping too much.	☐	☐	☐	☐
d. Feeling tired or having little energy.	☐	☐	☐	☐
e. Poor appetite or overeating.	☐	☐	☐	☐
f. Feeling bad about yourself, or that you are a failure, or have let yourself or your family down.	☐	☐	☐	☐
g. Trouble concentrating on things, such as reading the newspaper or watching TV.	☐	☐	☐	☐
h. Moving or speaking so slowly that other people could have noticed. Or the opposite; being so fidgety or restless that you have been moving around more than usual.	☐	☐	☐	☐
i. Thoughts that you would be better off dead or of hurting yourself in some way.	☐	☐	☐	☐

5. If you checked off any problem on this questionnaire so far, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

☐ Not difficult at all ☐ Somewhat difficult ☐ Very difficult ☐ Extremely difficult

6. Ov eeks, how been bothe lowing

	Not at all (0)	Several days (1)	More than half the days (2)	Nearly every day (3)
h. Feeling nervous, anxious, or on edge	☐	☐	☐	☐

i. Not being able to stop of control worrying	☐	☐	☐	☐
j. Worrying too much about different things	☐	☐	☐	☐
k. Trouble relaxing	☐	☐	☐	☐
l. Being so restless that it is hard to sit still	☐	☐	☐	☐
m. Becoming easily annoyed or irritable	☐	☐	☐	☐
n. Feeling afraid, as if something awful might happen	☐	☐	☐	☐

4. If you checked any problems, how difficult have they made it for you to do your work, take care of things at home, or get along with other people?

☐ Not difficult at all ☐ Somewhat difficult ☐ Very difficult ☐ Extremely

Below are 8 statements with which you may agree or disagree. Using the 1–7 scale below, indicate your agreement with each item by indicating that response for each statement.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

____ I lead a purposeful and meaningful life
____ My social relationships are supportive and rewarding
____ I am engaged and interested in my daily activities
____ I actively contribute to the happiness and well-being of others
____ I am competent and capable in the activities that are important to me

____ I am a good person and live a good life
____ I am optimistic about my future
____ People respect me

1. **In an overall, general sense, how satisfied are you with the service you have received?**

4	3	2	1
Very satisfied	Mostly satisfied	Indifferent or	Quite dissatisfied

2. **If you were to seek help again, would you come back to our program?**

1	2	3	4
No, definitely not	No, I don't think so	Yes, I think so	Yes, definitely

Within the last 6 weeks, have you been diagnosed or treated by a professional for any of the following:

No	Yes, diagnosed but not treated	Yes, treated with medication	Yes, treated with psychotherapy	Yes, treated with medication and psychotherapy	Yes, other treatment

Anxiety	☐	☐	☐	☐	☐	☐
Depression	☐	☐	☐	☐	☐	☐

What other counselling service programs have you participated in over the last 6 weeks (if any)?

Appendix C Interview Guide with Student Participants

RE-AIM-based Participant
Semi-Structured one-on-one interview for Program Evaluation

Welcome. Thank you for joining me today to participate in this interview. I am _____, and I am a part of the research team leading Mind in Motion.

This interview is important to gain a better understanding of the exercise program that was implemented on UBC campus for student mental health. Today I'd like us to discuss your thoughts about your participation in Mind in Motion. We will cover topics ranging from your perceptions of the program, how likely students are to engage with the program, and how we can improve the program in the future.

This interview will take approximately 45-60 minutes to complete.

Before we get started, I wanted to confirm that you had the chance to review the consent form. Do you have any questions about it?

[Await response]

Great! So, before we get started, I'll just review some major points on the form. First, this interview is entirely voluntary. We can stop at any time for any reason – please just let me know. You can also skip questions you're not comfortable answering; just say "pass". Second, this interview will be recorded. After we're done, members of the research team will transcribe this session word-for-word. We will then interpret the findings.

I'll also be taking notes so that I do not miss things that you have shared. If I'm quiet for a moment, it's probably because I'm writing.

I'm going to turn the recorder on now. I'm going to start with questions that confirm your consent to participate.

Today is [date]. This is a Mind in Motion year-end feedback interview with [participant number].

Have you had the opportunity to review the consent form?

Do you have any questions about this interview or study?

Do you consent to participate in this interview?

Do you consent to have this interview recorded?

Reach:

(Trying to answer: Was the referral strategy in this program an acceptable way to reach students on campus with depression? Why did students choose to participate, not participate, and/or drop out of the program?)

1) Thinking back to the beginning, what was your experience like being referred from counselling services to bodyworks?

2) *Do you think this is a good way to reach students on campus seeking mental health treatment?
   Probe: How can we inform more students about this program like this on campus?

      i. **Prompt:** through [counselling], Community flyers, referral, phone calls, email, etc.

3) *What made you interested in joining? (e.g., what information attracted you to the program)
   a. Probe: Do you feel that an exercise-based treatment is helpful for depression or anxiety?
      i. Probe: Do you feel that this was an appropriate treatment option for you?
   b. Probe: How confident were you about doing the intervention?

4) *Why did you choose to participate/ not participate/ drop out of the program?

Effectiveness:

(Trying to answer: What was the effect of Mind in Motion on the participants symptoms of depression?)

1) What did you think the program could help you accomplish?
   (probe: improvement in symptoms, reach fitness goals, healthy habits, etc)

2) *Do you feel the intervention was helpful to you?
   - Potential probes: How did you benefit from it?
     - Improved mood?
     - Fitness?
     - Other health benefits?
     - competency, autonomy, relatedness

Implementation:

~~What are the barriers and facilitators to the implementation of Mind in Motion for students with MDD on campus?~~
To what extent were the key aspects of Mind in Motion delivered as intended?

1) *How did you find the MIND IN MOTION program?

- Probe: What did you like/didn't you like about the program?

2) *What did participation in the intervention involve for you?
    - Probe: What did it cost you in terms of time/ opportunity/ effort to participate in the intervention? Energy?
    - Probe: What were the barriers for you to participate in this program, if any? (student schedule, mental health symptoms, school stress, etc.)
    - Probe: What facilitated your participation in the program? (further probe: working with the trainers, physical health benefits, encouragement from mental health staff)

2. *(If completed the program) What parts of the program helped you stay involved from the beginning to the end of Mind in Motion the most?
   Probe: program structure, duration, number of meeting sessions, location. Can you provide a few details as to why you feel this way?

2. (If didn't complete the program) What parts of the program made you consider not completing in Mind in Motion for the full 6 weeks?
   Probe: structure, duration of session, number of meeting sessions, location. Can you provide a few details as to why you feel this way?

3) *What do you think about the actual content of the exercise sessions throughout the 6-9 weeks?
    - Probe: The conversation/ advice / encouragement/ support from the exercise instructors?
    - Probe: The exercise programme components? Do you feel the exercise program was individually tailored to you? (autonomy)
    - Probe: Could the program be improved? If so, how? (e.g. setting)

4) How frequently did you complete the 3rd weekly independent session?
5) Is there anything we could have done to help you bridge to exercising on your own?

Wrap-up (Remaining Time)

1) *Do you see physical activity / exercise playing a role for you to support your mental health in the future?
    a. Probe: do you intend to keep exercising? Will you use the gyms on campus or in your own community?
2) Is there anything else you'd like to say about your experience of the intervention or about the intervention in general?

I am going to stop recording now. Thank you for your participation in this interview.

Appendix D Interview Guides with EPs

RE-AIM-based Counselling Services and Exercise Providers
Semi-Structured one-on-one interview for Program Evaluation

Welcome. Thank you for joining us today to participate in this interview. I am _____, and I am a part of the research team leading Mind in Motion.

This interview is important to gain a better understanding of the exercise program that was implemented on UBC campus for student mental health. Today I'd like us to discuss your thoughts about your participation in Mind in Motion. We will cover topics ranging from your perceptions of the program, how likely students are to engage with the program, and how we can improve the program in the future.

This interview will take approximately 45-60 minutes to complete.

Before we get started, I wanted to confirm that you had the chance to review the consent form. Do you have any questions about it?

[Await response]

Great! So, before we get started, I'll just review some major points on the form. First, this interview is entirely voluntary. We can stop at any time for any reason – please just let me know. You can also skip questions you're not comfortable answering; just say "pass". Second, this interview will be recorded. After we're done, members of the research team will transcribe this session word-for-word. We will then interpret the findings.

I'll also be taking notes so that I do not miss things that you have shared. If I'm quiet for a moment, it's probably because I'm writing.

I'm going to turn the recorder on now. I'm going to start with questions that confirm your consent to participate.

Today is [date]. This is a Mind in Motion year-end feedback interview with [participant number].

Have you had the opportunity to review the consent form?

Do you have any questions about this interview or study?

Do you consent to participate in this interview?

Do you consent to have this interview recorded

Introductions:

1. Can you start by telling me a little bit about yourself? For example, what year you're in, your experience as an exercise trainer, or what your favourite type of activity is?

Reach:

(Trying to answer: *Do you think the referral strategy for Mind in Motion was an acceptable way to reach students on campus with depression?)*

1) How many students did you work with?

2) *Over the past semester, we had ___ referrals, with 25 spots in the program available. Can you describe the degree to which the recruitment rate of participants met your expectations?
*Probe: In other words, do you think this referral strategy was an acceptable way to reach students on campus with depression?
*Probe: Mention any disparities in demographics if there is any at the end of the term (e.g. gender)

3) *What strategies do you think would work best next year to recruit students for Mind in Motion?
    a. Probe if not already discussed: Do you feel that the referral strategy used is a good way to reach students needing this type of treatment on campus?
    b. Probe: posters, flyers, booths, self-referral, referral from student health services
    c. Probe: Do you think students faced any barriers to being enrolled?

Implementation:

(Trying to answer: What are the barriers and facilitators to the implementation of Mind in Motion for students with MDD on campus? To what extent were the key aspects of Mind in Motion delivered as intended?)

1) Do you feel that an exercise-based treatment is helpful for depression or anxiety? Do you feel that this is an acceptable and/or appropriate treatment option for students?
    a. Probe: How do you think exercise might help with something like depression?

2) *Thinking back to September when before the MIM training day, how confident were you about delivering the intervention?
    a. What concerns or worries did you have about the intervention?
    b. What were you feeling good about?
    c. How would you rate your confidence now?
    d. What contributed to that change?

e. What could we do to support your confidence?

3) *What are your perceptions of training that was offered on Mind in Motion?
    a. Probe: What did you think of the duration of the training?
    b. Probe: What did you think of the frequency? Would you have preferred more than one training date?
    c. Probe: What did you think of the content?

4) What did you think about the MIND IN MOTION program in general?
        i. Probe: What did you like/didn't you like about the program?

5) *What did participation in Mind in Motion involve for you?
    a. Probe: What facilitated your participation in delivering the program? Barriers?

6) *What do you think about the actual content of the intervention?
    a. Probe: Were you confident in conversation/ advice / encouragement to the participants? Do you feel that you were provided with the right level of support to deliver the intervention?
    b. *Do you feel the exercise program was individually tailored well to the students with depression and/or anxiety? Did it feel right delivering the intervention?
    c. *Do you feel qualified to work with this population of students?
        1. What type of training do you think is needed for EPs to work with students with depression and/or anxiety?
        2. Consider your current level of training in personal training and mental health. Were there any barriers you faced because of this? Any facilitators? Any advice you would give to the counsellors referring to the program?
    d. Could the intervention be improved? If so, how? (i.e. setting)

7) How did you structure exercise programming for participants?

8) Did you think about how participants will continue with exercise after the program ends?
    a. If yes: What did you do to help increase the likelihood that people will keep exercising after the program ends?
    b. If no: What prevented you?

9) *Did you think about self-determination constructs when providing the intervention? By that, I mean encouraging autonomy, competency and relatedness?
    a. If yes: What did you do to support these?
    b. If no: What prevented you?

Maintenance:

(Trying to answer: What are the barriers and facilitators to the sustainability of Mind in Motion for students with MDD on campus?)

1) *What do you think are some of the barriers and facilitators to keeping this program running on campus in the future?

2) What is the likelihood that you would continue to support this intervention?

3) What would be needed for other end-users/ Exercise Professionals/ Kinesiology students to find this intervention meaningful and interesting to participate in?

Wrap-up (Remaining Time)

Is there anything else you'd like to say about your experience of the intervention or about the intervention in general?

I am going to stop recording now. Thank you for your participation in this focus group.

Appendix E Interview Guides with EPs – Management team

Reach:

(Trying to answer: *Do you think the referral strategy for Mind in Motion was an acceptable way to reach students on campus with depression?)*

4) *Over the past semester, we had ___ referrals, with 25 spots in the program available. Can you describe the degree to which the recruitment rate of participants met your expectations?
   *Probe: In other words, do you think this referral strategy was an acceptable way to reach students on campus with depression?
   *Probe: Mention any disparities in demographics if there is any at the end of the term (e.g. gender)

5) *What strategies do you think would work best next year to recruit students for Mind in Motion?
   a. Probe if not already discussed: Do you feel that the referral strategy used is a good way to reach students needing this type of treatment on campus?
   b. Probe: posters, flyers, booths, self-referral, referral from student health services
   c. Probe: Do you think students faced any barriers to being enrolled?

6) What did you think of the current referral method (coming in by fax?)
   a. Can you think of any ways this could be improved?
   b. How, if at all, could we make this process faster for the student to be enrolled?
   c. Can we do anything to support this process more?

Implementation:

(Trying to answer: What are the barriers and facilitators to the implementation of Mind in Motion for students with MDD on campus? To what extent were the key aspects of Mind in Motion delivered as intended?)

10) Do you feel that an exercise-based treatment is helpful for depression or anxiety? Do you feel that this is an acceptable and/or appropriate treatment option for students?
   a. Probe: How do you think exercise might help with something like depression?

11) *What are your perceptions of training that was offered on Mind in Motion with the BodyWorks team?
   a. Probe: What did you think of the duration of the training?
   b. Probe: What did you think of the frequency? Would you have preferred more than one training date?
   c. Probe: What did you think of the content?

12) *Thinking back to September when before the MIM training day, how confident were

you about delivering the intervention with your team?

a. What concerns or worries did you have about the intervention?
b. What were you feeling good about?
c. How would you rate your confidence now?
d. What contributed to that change?
e. What could we do to support your confidence?

13) What did you think about the MIND IN MOTION program in general?
    i. Probe: What did you like/didn't you like about the program?

14) *What do you think about the actual content of the intervention?
    a. Is there anything you would like to change if we continue next year?
    b. How can we support students further to keep them enrolled in the program and coming in twice a week?
    c. Do you feel that you were provided with the right level of support to deliver the intervention?
    d. *Do you feel the exercise program was individually tailored well to the students with depression and/or anxiety? Did it feel right delivering the intervention?
    e. *Do you feel qualified to work with this population of students?
        1. What type of training do you think is needed for EPs to work with students with depression and/or anxiety?
        2. Consider your current level of training in personal training and mental health. Were there any barriers you faced because of this? Any facilitators? Any advice you would give to the counsellors referring to the program?
    f. Could the intervention be improved? If so, how?

15) Did you think about how participants will continue with exercise after the program ends?

Maintenance:

(Trying to answer: What are the barriers and facilitators to the sustainability of Mind in Motion for students with MDD on campus?)

4) *What do you think are some of the barriers and facilitators to keeping this program running on campus in the future?

5) What is the likelihood that you would continue to support this intervention?

6) What would be needed for other end-users/ Exercise Professionals/ Kinesiology students to find this intervention meaningful and interesting to participate in?

Appendix F Interview Guides with Referral Agents (Counselling staff)

Intro questions:

1) How many students do you work with on a typical day? Have you noticed any trends or patterns in student characteristics? For example, presenting problems or acuity of symptoms? (gender trends)

2) Is exercise or physical activity something that typically comes up when you work with students?
    a. If yes: What do these conversations typically look like?
    b. If no: Is there anything that prevents you from talking about exercise?

Reach:
(Trying to answer: *Do you think the referral strategy for Mind in Motion was an acceptable way to reach students on campus with depression?)*

1) *Over the past semester, we had ___ referrals, with 25 spots in the program available. Can you describe the degree to which the recruitment rate of participants met your expectations?
    Probe: Does this surprise you?
    *Probe: In other words, do you think this referral strategy was an acceptable way to reach students on campus with depression?
    Probe: Mention any disparities in demographics if there is any at the end of the term (e.g. gender)

2) *What strategies do you think would work best to recruit students for Mind in Motion in the future?
    a. Probe if not already discussed: Do you feel that the referral strategy used is a good way to reach students needing this type of treatment on campus?

Adoption:
(Trying to answer: Was the referral strategy in this program accepted, and widely adopted by all potential referral agents?)

1) *Since September 2024, about what percentage of students did you discuss Mind in Motion with?
    a. How many of those students seemed interested?

b. Were there certain student characteristics that you looked for that made you think they're a good or poor fit for the program?

2) *Tell me about how you discussed the program with potential referrals?

3) What made you interested in referring to Mind in Motion?

4) *How confident were you about referring to the intervention?
   a. Do you have any concerns or worries about the intervention?

5) *If you discontinued referring to the intervention, why did you do this?

6) *Do you feel that an exercise-based treatment is helpful for depression or anxiety? Do you feel that this is an acceptable and/or appropriate treatment option for students?
   a. Probe: How do you think exercise might help with something like depression?
   b. Is referring students to an exercise intervention for their mental health a good fit for your role as a counsellor?

Implementation:

(Trying to answer: What are the barriers and facilitators to the implementation of Mind in Motion for students with MDD on campus? To what extent were the key aspects of Mind in Motion delivered as intended?)

1) *What did you think of the MIND IN MOTION program?
   i. Probe: What did you like/didn't you like about the program?

2) *What were the barriers for you to refer to this program, if any?
   a. Probe: What facilitated your participation in referring to the program?
   b. Probe: Was there anything that prevented you from referring?

3) *What are your perceptions of training that was offered on Mind in Motion?
   a. Probe: What did you think of the duration of the training?
   b. Probe: What did you think of the frequency? Would you have preferred more than one training date?
   c. Probe: What did you think of the content?

4) *What do you think about the actual content of the intervention?
   a. Probe: Do you feel confident that the Exercise professionals (EPs) in this

intervention are qualified to work with this population of students?

1. What type of training do you think is needed for EPs to work with students with depression and/or anxiety?

b. Could the intervention be improved? If so, how? (i.e. setting)

5) Did you meet with any students after they were referred and started the program? What did you notice about their experience or symptoms?

Maintenance:

(Trying to answer: What are the barriers and facilitators to the sustainability of Mind in Motion for students with MDD on campus?)

1) *What do you think are some of the barriers and facilitators to keeping this program running on campus in the future?

2) *What is the likelihood that you would continue to support this intervention and refer students in the future?

3) What would be needed for other end-users/ counsellors to find this intervention meaningful?

Wrap-up (Remaining Time)

Is there anything else you'd like to say about your experience of the intervention or about the intervention in general?

I am going to stop recording now. Thank you for your participation in this interview.

Appendix G Referral Card

You're Invited To:

MIND IN MOTION

Your counsellor has referred you to a physical activity program.

Physical activity has been shown to help people**:**

- **Improve their mood**
- **Increase their energy levels**
- **Sleep better**
- **Increase their ability to focus**
- **Reduce feelings of stress and anxiousness**

Mind in Motion is a program designed specifically
to help UBC students seeking mental health services
or counselling on campus to do more physical activity!

A Bodyworks Personal Trainer will be in contact with you soon.

If you have any questions
please call or email:

pop_pa.lab@ubc.ca

Who is running MIND IN MOTION? MIND IN MOTION is being coordinated by UBC Counselling Services in collaboration with the Population Physical Activity Lab and UBC BodyWorks Gym.

Why exercise? In 2016, the Canadian Network for Mood and Anxiety Treatments (CANMAT) identified exercise as a **first-line treatment** for mild-moderate depressive symptoms, and an **adjunctive treatment** for moderate-severe depressive symptoms. Exercise is about as effective as medication or therapy in treating depressive symptoms.

What is MIND IN MOTION studying? Even though exercise is recommended as a treatment, it is rarely offered to people experiencing depressive symptoms. MIND IN MOTION is interested in whether on-campus exercise programming is feasible and effective.

What does the exercise program involve? If you sign up for the program, you will work with a qualified exercise provider to develop a personalized exercise program. The program **with two 1-hour sessions per week for 6 weeks, with the option of extending for an additional 6 weeks**. Booking your sessions is done online and you can pick times that suit your schedule.

What does the study involve? You will be asked to complete questionnaires before, during, and after the exercise program. These questionnaires will help us understand the impact of MIND IN MOTION on your mental and physical health. You will also be asked to participate in an individual interview after the program.

How will participation affect my health care? It won't! Participating in MIND IN MOTION is entirely voluntary and will have **no impact** on your regular health care.

What will you do with my health information? Your privacy is our top priority. The UBC Mind in Motion research team and Bodyworks partners will keep your information strictly confidential. With your permission, we will provide your referring provider with updates summarizing your participation in this program. With this referral, your name, birthday, psychological diagnosis, and relevant medications will be sent securely to the lead BodyWorks staff to begin your enrollment process. This information helps to make sure that you are eligible for this type of exercise program.

What's next? We will review your referral document and contact you shortly for eligibility screening. Please expect a response in 5-10 business days.

Who can I talk to for more information? Please contact our study team at pop_pa.lab@ubc.ca

Who is in charge of this research? The principal investigator for this research study is Dr. Guy Faulkner, Ph.D., School of Kinesiology, UBC.

Appendix H Referral form

REFERRING PROVIDER:	☐ Wellness Advisor- Brock Hall ☐ Mental Health Provider- Annex ☐ Mental Health Provider - Brock Hall ☐ Mental Health Provider - Embedded		
Name:			E-mail:
Embedded Site if applicable:			Telephone:
STUDENT INFORMATION:	DOB:	Sex: ☐ Female ☐ Male ☐ Intersex	
First name:	Middle name:		Last name:
Telephone:		E-mail:	
ELIGIBILITY:		**INELIGIBILITY:**	
☐ Current UBC student (part or full time)		☐ Acute risk of harm to self or others	
☐ Age 18+ years		☐ Current or historic eating disorder	
☐ Can communicate in English		☐ Active alcohol or substance use disorder	
☐ Attend UBC-Vancouver Campus		☐ Serious mental illness	
☐ Mild-moderate depression OR PHQ-9 =5-19		☐ Severe depression OR PHQ $\geq$ 20	
☐ Exercise $\leq$ 2 times/week OR $\leq$ 90 minutes/week		☐ Other mental health diagnoses / symptoms that you feel makes the student a poor fit for exercise	
MENTAL HEALTH DIAGNOSIS IF KNOWN:	PHQ-9 score:	GAD-7 score:	
Symptoms consistent with:			
☐ Major depressive disorder		☐ Bipolar I disorder ☐ Bipolar II disorder	
☐ Generalized Anxiety		☐	
☐ Other Anxiety- disorder:		☐ Other psych. Dx:	
☐ Other depressive disorder:		☐ Other psych. Dx:	
TREATMENT:	Currently receiving treatment for depression: ☐ Y ☐ N ☐ Waitlisted		

Current mental health supports:	

☐ **Consent to Share Information:** I hereby consent to sharing of relevant information between Counselling Services and Mind in Motion Study to facilitate referral.

Student Signature: Date:

Referred by: Signature: Date:

Supervisor Signature (if appropriate): Date:

☐ I acknowledge that this referral is to the MIND IN MOTION Study, coordinated through the UBC School of Kinesiology (Research Ethics #H17-02498-A011).

☐ I have discussed this referral with the student and have provided them with the information letter.

Signature of referring provider	**Date**

Appendix I CORE-Q

COREQ (COnsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
Personal characteristics			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	54
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	54
Occupation	3	What was their occupation at the time of the study?	54
Gender	4	Was the researcher male or female?	N/A
Experience and training	5	What experience or training did the researcher have?	54
Relationship with participants			
Relationship established	6	Was a relationship established prior to study commencement?	57
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	58
Interviewer characteristics	8	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	58
Domain 2: Study design			
Theoretical framework			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	58
Participant selection			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	55
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	55
Sample size	12	How many participants were in the study?	54
Non-participation	13	How many people refused to participate or dropped out? Reasons?	N/A
Setting			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	56
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	56
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	54, 69, 82
Data collection			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	56
Repeat interviews	18	Were repeat inter views carried out? If yes, how many?	N/A
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	56-57
Field notes	20	Were field notes made during and/or after the inter view or focus group?	57
Duration	21	What was the duration of the inter views or focus group?	57
Data saturation	22	Was data saturation discussed?	55
Transcripts returned	23	Were transcripts returned to participants for comment and/or	64

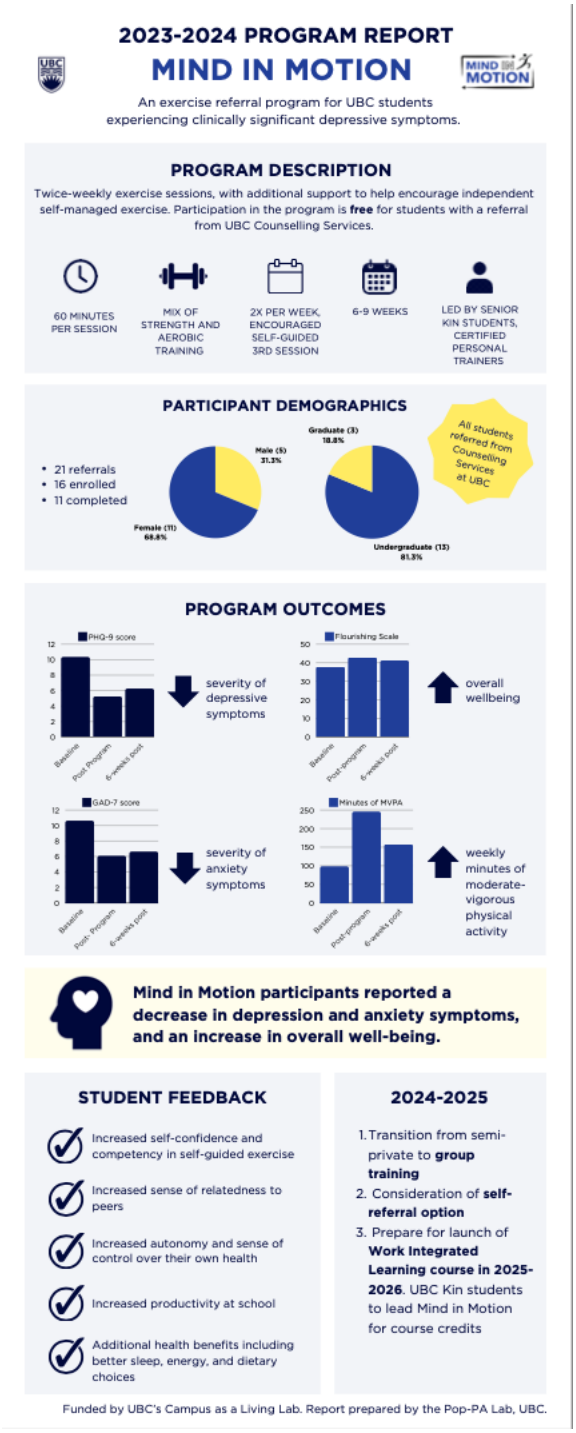
Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
Data analysis			
Number of data coders	24	How many data coders coded the data?	58
Description of the coding tree	25	Did authors provide a description of the coding tree?	N/A
Derivation of themes	26	Were themes identified in advance or derived from the data?	58
Software	27	What software, if applicable, was used to manage the data?	58
Participant checking	28	Did participants provide feedback on the findings?	64
Reporting			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Chapter 5
Data and findings consistent	30	Was there consistency between the data presented and the findings?	Chapter 5
Clarity of major themes	31	Were major themes clearly presented in the findings?	Chapter 5
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	Chapter 5

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. DO NOT include this checklist as part of the main manuscript document. It must be uploaded as a separate file.

Appendix J Poster MIM

Appendix K Year End Report



Appendix L Student Attendance records

Participants	Completed program Y/N (12 sessions)	# of sessions completed	# of weeks to complete/ enrolled	Notes
SP1	Y	12	7	Only participant to finish the program in term 1
SP2	N	10	9	Loss of contact after Christmas break with 2 sessions left Did not attend MIM session on Feb 11
SP3	Y	12	13	Completed 2 weeks of program then was away for 1.5 months for Christmas
SP4	Y	12	7	Took 1 week off for spring break
SP5	Y	12*	9.5	*Initially stated as 14. Confirmed did not attend Feb 25/28 so 12 sessions total.
SP6	N	1	/	Only attended first session on Jan 28, 2024
SP7	Y	12	11	Took 1 week off due to illness – week of March 11 (cancelled session on Mar 14)
SP8	Y	12	10	
SP9	Y	12	9.5	
SP10	N	0	/	Only attended fitness assessment. Client requested to be withdrawn from program, found alternative with friends that was working well for them at time of withdrawal.
SP11	N	9*	8	*Client attended 9 session (not 7)
SP12	Y	12	8	
SP13	Y	14	8	No final fitness assessment completed

SP14	N	4	4	Did not attend Mar 9/Mar 10 sessions due to instructor not attending Mar 9 session. Apr 6-7 no show.
SP15	N	7	6	Emailed could not attend session on March 9 will return following week. No show on Feb 29 (original first session)
SP16	N	8	7	

Appendix M Student Reach

Student reach	**Total number**	**Notes/ Reason**
Eligible students seeking Counselling Services from Sept 25, 2023- Feb 5 2024	704	2151 unique clients/students sought initial appointments between those dates, 704 of whom presented with depression as a primary presenting concern/or 32.7% of students.
Spaces available in MIM between Sept 2023- April 2024	50	
# of students referred	21	8 in Term 1 (T1), 13 in Term 2 (T2)
# of students referred but not enrolled	5	Found another mode of social exercise, could not meet 2X a week, ineligibility/ loss of contact, ankle injury, would not like to be enrolled
# of students enrolled	16	2 students enrolled in T1, 14 in T2 (5 students referred in T1 did not enroll until T2)
# of students enrolled but not completed	4	4 were not able to attend 12 sessions before the program cutoff date at the end of T2
# of student dropouts	3	2 only attended the initial fitness assessments and decided not to participate in the program. 1 was a loss of follow up after their 10^{th} session.
# of students completed the program	9	1 in T1, 8 in T2