

University of British Columbia

Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

Initiatives to Promote Walking on The University of British Columbia's Vancouver Campus

Prepared by: Ryan Alfonso, Hana Kotani, Juliette Sachet, Raha Tavakolifard

Prepared for:

Course Code: KIN 464

University of British Columbia

Date: 13 April 2021

Disclaimer: "UBC SEEDS Sustainability Program provides students with the opportunity to share the findings of their studies, as well as their opinions, conclusions and recommendations with the UBC community. The reader should bear in mind that this is a student research project and is not an official document of UBC. Furthermore, readers should bear in mind that these reports may not reflect the current status of activities at UBC. We urge you to contact the research persons mentioned in a report or the SEEDS Sustainability Program representative about the current status of the subject matter of a report".



**Initiatives to Promote Walking on The University of British Columbia's Vancouver
Campus**

Ryan Alfonso

Hana Kotani

Juliette Sachet

Raha Tavakolifard

KIN 464 001: Health Promotion and Physical Activity

Dr. Andrea Bundon

April 13, 2021

This research was mostly conducted on the traditional, ancestral, and unceded territory of the

xwməθkwəyəm (Musqueam) People.

Table of Contents:

	Page #
1. Executive Summary	3
2. Introduction & Literature Review.....	4
3. Methods	7
4. Results	10
5. Discussion	14
6. Limitations	19
7. Future Recommendations.....	21
8. Conclusion	23
9. References	24
10. Appendix	27
A.	27
B.	28
C.	30
D.	36

Executive Summary:

The purpose of this study was to understand UBC students' perceptions of, and barriers to walking on the UBC Vancouver campus. This year, an outlined project priority from our campus partners was to foster wellbeing and inclusive place-based and resilient communities by promoting more walking on campus (UBC SEEDS, 2021). As previously identified, when young adults begin university, there is typically a decline in their overall participation in physical activity (Leslie, Sparling & Owen, 2001). Similarly, this transition enhances perceived barriers for university students to participate in PA, defined through intrapersonal, interpersonal, and structural barriers (Carballo-Fazanes, 2020; Thomas et al., 2019).

An online survey was created and piloted using Qualtrics software and consisted of 26 questions that took approximately 5 minutes to complete. This was then distributed across social media platforms such as *Facebook*, *Instagram* and word of mouth between March 2021 and April 2021 (see Appendix A). The survey was posted in group chats and group pages that are associated with our target population of current UBC students who live on the Vancouver campus to better understand their walking behaviours and perceptions.

The total number of participants who completed the survey was 42, and of those 29 identified as female, 12 identified as male and 1 identified as other. Additionally, all students currently live on campus and are enrolled in classes at UBC. It was indicated that of these participants 9.5% reported they went on leisure walks "everyday", 19.0% reported "most days", 35.7% reported "on a few days", 21.4% reported "once a week" and 14.3% reported "never". However, in regards to transportation, 90.5% of participants used walking as their primary mode of transportation on campus.

In regards to safety, an implication of this study is that students reported feeling relatively safe walking on campus during the day, with the average score being 4.4, 5 representing feeling the most safe. However, when asked about their perception of safety walking on campus in the evening and nighttime, this score dropped to 3.0. The data also suggests that there is a correlation between gender differences and perceived safety on campus.

Future recommendations have been outlined in 4 key avenues including campus infrastructure, education, improving current UBC walking initiatives, and research. Campus infrastructure should be further investigated in regards to safety on campus where lighting and security have been identified by participants as ways the university may increase walking on campus. The recommendation of education is to provide first year university students who typically come from diverse academic backgrounds to gain a standard level of knowledge pertaining to the physical and mental benefits of walking. The third recommendation is to improve current UBC walking initiatives such as AMS *Safewalk*. Lastly, the recommendation of research is to identify critical questions, directions, and insight for further contributions that were out of the scope of this present study.

Introduction:

The University of British Columbia (UBC) Social Ecological Economic Development Studies (SEEDS) Sustainability Program aims to advance sustainability ideas, policies, and practices as well as create social impacts by using the campus as a living laboratory (UBC SEEDS, 2021). This year, an outlined project priority for SEEDS is to foster wellbeing and inclusive place-based and resilient communities by promoting more walking on campus (UBC SEEDS, 2021). University students have been identified as a population in which rates of regular physical activity (PA) decline due to intrapersonal, social, and structural factors as well as academic commitments (Thomas et al., 2019; Carballo-Fazanes, 2020). This is significant as sedentary behaviours beginning at the university level are shown to continue into adulthood (Thomas et al., 2019). This study acknowledges walking as an activity that is inclusive to people of all PA levels, abilities, ages, genders, and race as well as that UBC's Vancouver campus offers significant space to walk on its over 400-hectare campus (The University of British Columbia, n.d.). This study aims to get an understanding of the perceptions of and barriers to walking of current students living on UBC's Vancouver campus, in order to provide recommendations to promote walking as a form of PA which in turn, holds the opportunity to promote individual and community health on campus.

Literature Review

Regular physical activity (PA) is consistently identified as an essential component of maintaining and promoting one's overall health and wellbeing (Blair, 2009; Warburton, & Bredin, 2017). Participating in regular PA reduces the risk of mortality and of many chronic diseases such as cardiovascular disease, diabetes, cancer and osteoporosis (Blair, 2009;

Warburton, & Bredin 2017). The benefits of PA extend beyond physical health, with a growing body of evidence linking PA to positive mental health outcomes, such as improved mood and self-esteem (Callaghan, 2004). Additionally, studies indicate that PA reduces anxiety and depression symptoms (Callaghan, 2004; Penedo & Dahn, 2005).

Despite overwhelming evidence supporting the extensive physical and mental health benefits of PA, the majority of Canadians are not sufficiently active (Clarke, Colley, Janssen & Tremblay, 2019). According to Statistics Canada, only 44.8% of all Canadians met the weekly 150 minutes of moderate to vigorous PA recommended by Health Canada between 2016 and 2017 (Clarke et al., 2019). Moderate intensity PA is defined as a physical activity where the individual is breathing slightly harder than at rest, such as brisk walking (CESP, 2011). Vigorous-intensity PA is defined as a physical activity where the individual is out of breath, such as jogging (CESP, 2011). These findings are significant as the World Health Organization (2009) found that inactivity poses a considerable health risk and is estimated to be the fourth most common cause of mortality worldwide, contributing to 3.2 million deaths annually. Thus, regular PA in the general population is crucial to promote health and reduce the rates of chronic health conditions (Blair, 2009).

A decline in physical activity participation has been observed when young adults attend university (Leslie, Sparling & Owen, 2001). Implementing strategies to increase participation in university students is important as PA habits during this time are shown to impact long-term PA habits in later life (Bray & Born, 2004; Leslie et al., 2001; Thomas et al., 2019). The transition to university for many people may be characterized by change, ambiguity, and adjustment from previous life domains (Bray & Born, 2004). This transition enhances perceived barriers for university students to participate in PA, defined through intrapersonal, interpersonal, and

structural factors (Carballo-Fazanes, 2020; Thomas et al., 2019). Intrapersonal factors that have been analyzed include psychological states such as stress, perceived skill, past experiences, and motivation (Thomas et al., 2019). According to Griffiths, Moore & Brunton (2020), individuals are less likely to take up a new activity during this phase of transition. Additionally, interpersonal factors are related to the social environment and include peer influence, relationships, body image comparisons and removal from past physical activity environments (Carballo-Fazanes, 2020; Thomas et al., 2019). Structural factors arise from external conditions, such as lack of time, money, or accessibility (Griffiths et al., 2020; Thomas et al., 2019). Many university students express concern about participating in PA due to lack of time and balancing commitments (Griffiths et al., 2020). A university-wide study by Carballo-Fazanes (2020), aimed to address students' overall participation in PA and their perceived barriers. The results indicated that 75.1% of students found that the largest barrier for regular participation in PA was lack of time (Carballo-Fazanes, 2020).

Walking is considered a form of moderate-intensity PA and is a predictor of positive health outcomes (Lee & Buchner, 2008; Morris & Hardman, 1997). According to Morris and Hardman (1997), walking is a dynamic and aerobic activity that promotes many physical benefits such as bone strength and cardiovascular endurance. Additionally, there is a growing body of evidence suggesting walking has many mental health benefits, including an improved mood (Kelly et al., 2018). Walking is considered convenient, self-regulated, safe and may be readily accessible in urban, rural, and indoor scapes year-round (Morris & Hardman, 1997; Ogilvie et al., 2007). This activity has also been identified as one of the best habit-forming activities to promote healthy lifestyle behaviours in sedentary populations (Lee & Buchner, 2008).

Integrating walking into the lifestyles of university students can increase positive physical and mental health outcomes (Kelly et al., 2018; Lee & Buchner, 2008).

It has been identified that university students do not meet the recommended levels of weekly PA (Clarke et al., 2019). Despite the known benefits of walking for physical and mental health, there is insufficient research on initiatives aiming to promote walking as a form of PA in Canadian university students. The purpose of the study was to explore topics including: (1) physical activity behaviours of UBC students living on campus. To explore this, likert-type scale questions were incorporated into the survey such as asking participants how often “In a typical week, [they] participate in 150 minutes of moderate to vigorous intensity aerobic physical activity.” We also presented questions relating to (2) walking behaviours of UBC students living on campus. To achieve this, participants were asked to report “How often in a week do [they] go on leisure walks when [they] do not have to be somewhere,” and to rate their agreeance with likert-type scale questions such as “Whenever possible I aim to walk instead of using a bus or car.” Another topic of interest was, (3) university students' perceptions of walking, which included its health benefits, enjoyment, and safety on campus. This was explored by having participants rate their agreeance with likert-type scale questions such as; “I believe walking has benefits to my physical health”, “I enjoy walking on campus”, and “I feel safe walking on campus alone.” The last topic of interest pertained to (4) initiatives to increase walking behaviours which was asked through the open-ended question “Is there anything that the university could do, to increase your frequency of walking?”

Methods

A study conducted by Ariffin and Zahari (2013) found the use of surveys as an effective method to gather data on participants' perceptions of urban walking environments. In line with

this research, an online survey was used for the purpose of data collection, utilizing the social media platform Facebook as well as word of mouth. The survey was distributed between March 24th, 2021 and April 5th, 2021 (see Appendix A). More specifically, the survey was distributed through Facebook by uploading a social media poster on our personal Facebook “walls” (See Appendix A).

As the purpose of the research is to provide recommendations for promoting walking specifically on UBC’s Vancouver campus, the inclusion criteria for our study was university students who live on the UBC Vancouver campus. Furthermore, in order to decrease the likelihood of participants misremembering their experiences of walking on campus, the exclusion criteria for our study was any students not living on campus at the time of taking the survey. This accounts for the COVID-19 pandemic where students who did not live on campus were less likely to travel to or walk on campus frequently. Furthermore, to gather data that was representative of UBC’s diverse student body, students of all ages, gender identities, faculties, schools, and years of study, were part of the inclusion criteria.

The survey was created and piloted using Qualtrics software and consisted of 26 questions that took approximately 5 minutes to complete. The survey did not collect any personal identification data for confidentiality purposes and in order to minimize the likelihood of participants providing socially desirable responses as identified by Nederhof (1985). Upon starting the survey, participants were first presented with the consent form, which was mandatory to fill out before continuing with the survey (refer to Appendix B). The survey utilized a mixed methods approach to gathering data. Quantitative data was collected through multiple choice and likert-type scale questions while the usage of two open-ended questions as well as three

opportunities for participants to elaborate on multiple choice answers provided qualitative data (See Appendix C).

The likert-type scale questions had answers ranging from “strongly disagree” to “strongly agree”, “never” to “every day” or “never” to “always” depending on the question (see Appendix C for the full range. The questions were worded in a way so that some questions such as “I believe walking has benefits to my physical health” had the answer “strongly agree” represent a more favourable behaviour or perception, while other questions such as “I do not consider walking as a mode of exercise/physical activity” had the answer “strongly agree” represent a less favourable behaviour or perception. This was to decrease the likelihood of participants answering “strongly agree” to everything. These answers were then converted into numerical values on a continuum from 1 to 5 where 5 represented more favourable health behaviours or perceptions and 1 represented less favourable health behaviours or perceptions, based on prior research that was conducted. For example, a score of 4.5 out of 5 for the question “I do not consider walking as a mode of exercise/physical activity” would indicate a favourable perception about walking.

The qualitative questions such as, “Why do you, or don’t you go for walks?” were asked in order to get a more in depth understanding of the participants’ quantitative responses and offer an opportunity to elaborate on factors that may not have been brought out through the likert-type and multiple-choice questions. The qualitative questions were asked in order to find similar responses between participants in order to draw conclusions. For example, with the question, “Is there anything that the University could do to increase your frequency of walking?”, similar responses can be used to make informed recommendations to the Campus Partners to promote walking on campus.

The mixed-methods data from the survey was analyzed using a combination of descriptive statistical analysis and qualitative descriptive analysis. The multiple choice and likert-type scale questions were analyzed via descriptive statistics in order to measure central tendency and variability in the data. Survey responses were exported from Qualtrics software into Excel and were organized so that each row represented one participant and each column represented one variable. In total 78 responses were collected out of which 42 met the criteria necessary for the data to be utilized. 16 participants were removed on the basis of the exclusion criteria of not living on campus and 20 more were excluded for not finishing the survey. The excel spreadsheet was then converted to a CSV file in order to be imported into JASP, a statistical analysis software. JASP was used to measure central tendency and variability and to create descriptive statistics and frequency tables. Excel was then used to create bar graphs and pie charts. The two open-ended questions as well as the three “other” text entry options were analyzed using descriptive qualitative analysis (See Appendix C for the questions). For each of the open-ended questions, the responses from each participant were compared and trends and themes were identified based on similar responses between participants.

Results

Participants:

The sample consisted of 42 UBC students living on UBC Vancouver’s campus. The mean age was 21.0 years, with ages ranging from 18.0 to 28.0 years (Appendix D, Table 1). The sample consisted of 38 undergraduate students, 3 masters students and 1 student in a professional program (Appendix D, Table 2). 69.0% of participants (n = 29) identified as female, 28.6% (n = 12) identified as male and 2.4% (n = 1) identified as other (Appendix D, Table 3). The participants from this study belonged to a variety of different faculties and schools within UBC.

Out of 42 participants, 23.8% of participants were in the School of Kinesiology (n = 10), 21.4% in the Faculty of Science (n = 9), 16.7% in the Faculty of Arts (n = 7), 14.3% in the Faculty of Engineering (n = 6), 11.9% in Sauder School of Business (n = 5), 2.4% in the Faculty of Forestry (n = 1), 2.4% in the Faculty of Music (n = 1), 2.4% in the Faculty of Medicine (n = 1), 2.4% in the Faculty of Land and Food Systems (n = 1) and 2.4% in the Faculty of Pharmaceutical Sciences (n = 1) (Appendix D, Table 4).

Physical Activity Behaviours:

Of the 42 participants, 59.5% were aware of the Canadian Physical Activity Guidelines of participating in 150 minutes of moderate to vigorous intensity aerobic PA per week (n = 25), while 40.5% of participants were not aware (n = 17) (Appendix D, Table 5). Most participants reported engaging in some level of physical activity, with 33.3% of participants reporting always meeting the Canadian Physical Activity Guidelines (n = 14), 28.6% reporting meeting them most of time (n = 12), 7.1% reporting meeting them about half the time (n = 3), 23.8% reporting meeting them sometimes (n = 10), and 7.1% reporting never meeting them (n = 3) (Appendix D, Figure 1). Participants who did not report “always” meeting Canadian Physical Activity Guidelines (n = 28) were then asked about barriers to physical activity which they identified as lack of motivation, lack of time, lack of accessibility to fitness facilities, physical limitations and other factors (Appendix D, Figure 2). Lack of motivation was the most common, with 78.5% of participants reporting it as a barrier (n = 22), closely followed by lack of time which was reported by 71.4% of participants (n = 20). 32.1% of participants also reported lack of accessibility to fitness facilities as a barrier (n = 9), 21.4% reported physical limitations (n = 6) and 7% reported simply not enjoying physical activity (n = 2) (Appendix D, Figure 2). Five participants identified other barriers to physical activity which were COVID-19 restrictions,

being embarrassed and an introvert, mental health issues, and having multiple injuries and health problems (Appendix D, Figure 2).

Walking Behaviours:

When asked about the amount of times in a given week that participants go for a leisure walk when they don't have somewhere to be, 9.5% reported "everyday" (n = 4), 19.0 % reported "most days" (n = 8), 35.7% reported "on a few days" (n = 15), 21.4% reported "once a week" (n = 9) and 14.3% reported "never" (n = 6) (Appendix D, Figure 3). In regards to transportation, walking was the primary mode of transportation on campus for 90.5% of participants (n = 38). The rest of the participants reported biking (n =1), long-boarding (n = 1), skateboarding (n = 1) and busing (n = 1) as their primary mode of transportation (Appendix D, Figure 4). When presented with the statement "Whenever possible, I aim to walk instead of using a bus or car", the average score was 3.5 out of 5 (Appendix D, Table 6). Similarly, when presented with the statement "I prefer to take the bus from one end of campus to the other instead of walking", the average score was 3.9 out of 5 (Appendix D, Table 6).

Perceptions of Walking:

Participants scored 4.3 out of 5 when presented with the statement "I enjoy walking on campus", and 4.0 out of 5 when presented with the statement "I enjoy going on walks around campus between classes or when I don't have somewhere to be" (Appendix D, Table 7). In regards to perceptions around health benefits, participants generally believed that walking has benefits to both their physical and mental health, scoring on average 4.6 for physical health and 4.6 for mental health on a 5 point scale (Appendix D, Table 8). Similarly, participants scored 4.8 and 5 on average when presented with the statement "There are no long-term physical health benefits of walking" (Appendix D, Table 9). They also generally agreed with the statement

“There are long term mental health benefits to walking”, scoring on average 4.5 out of 5 (Appendix D, Table 9). Furthermore, participants scored on average 3.8 out of 5 when presented with the statement, “I do not consider walking as a mode of exercise/physical activity” and 3.0 when presented with the statement “Because walking is not an effective form of physical activity, I prefer to engage in higher intensity exercise instead” (Appendix D, Table 10). In regards to specific health benefits, 97.6% of participants believed that improved mood is a benefit associated with walking (n = 41), 64.3% believed that improved cardiovascular endurance is associated with walking (n = 27) and 35.7% believe that it is also associated with increased bone strength (n =15) (Appendix D, Figure 5).

In general, students reported feeling relatively safe walking on campus during the day, with the average score being 4.4, 5 representing feeling the most safe (Appendix D, Table 11). When asked about their perception of safety walking on campus in the evening and nighttime, this score dropped to 3.0 (Appendix D, Table 11). Gender differences in perceived safety walking on campus in the evening/nighttime were found. Female participants scored 2.4 on average compared to 4.3 in male participants and 4.0 in the participant who identified as other (Appendix D, Table 12). Participants also reported on their perceived safety of walking alone on campus, with the average score being 3.5, 5 representing feeling the most safe (Appendix D, Table 11). Gender differences in perceived safety walking alone on campus were observed as well. Female participants scored 3.1 on average, while male participants scored 4.4 on average, and the participant who identified as other scored 4.0 (Appendix D, Table 13).

Qualitative Data Analysis:

For the question “What can the university do to increase your frequency of walking?”, participants’ answers aligned with 4 main themes: lighting, safety, campus programs &

infrastructures and classes-related factors. Lighting-related suggestions came up 5 times, other safety-related suggestions came up 7 times, suggestions related to campus programs and & infrastructures came up 7 times and class-related factors came up 3 times. These responses were organized into a table according to these main themes. Mental health reasons was the most commonly occurring theme (Appendix D, Table 14). Similarly, for the question “Why do you or do you not walk?” common themes between participants regarding reasons they walk were mental health, physical health, nature/fresh air, social connection and other (Appendix D, Table 15). For reasons regarding why they do not walk, lack of time, preference of other forms of PA, physical limitations and the fact that they do not enjoy exercise were main themes identified (Appendix D, Table 16).

Discussion:

Current PA and Walking Behaviours of Students Living on Campus:

Previous literature suggests that university students do not meet the weekly 150 minutes of moderate to vigorous PA recommended by Health Canada (Clarke et al., 2019; Lee & Buchner, 2008). These findings were further supported by our results which indicate that only 33.3% of participants reported “always” meeting the PA guidelines (Appendix D, Figure 1). In regards to barriers to physical activity, our results revealed that "lack of motivation" was the most common, with 78.5% of participants reporting it as a barrier (Appendix D, Figure 2). This is supported by previous research by Thomas and colleagues (2019) which stated that motivation is positively associated with PA participation. Previous research has also identified lack of time as a significant perceived barrier to physical activity. Carballo-Fazanes, (2020) found that 75.1% of participants did not participate in regular PA due to lack of time. Similarly, our findings indicated that 71.4% of participants experienced lack of time as a barrier to regularly meeting the

PA guidelines (Appendix D, Figure 2). Moreover, our data indicates that accessibility to fitness facilities is a barrier to physical activity (Appendix D, Figure 2). This is supported by Griffiths and colleagues (2020) suggesting that the structural barriers greatly influence accessibility and therefore, regular participation in PA. According to a participant in their study, “although they want to access it, can they actually access it is another question” in regards to regular PA participation in a gym facility (Griffiths et al., 2020). Considering the barriers to physical activity, such as lack of time and access to fitness facilities, walking may be a beneficial activity that could be further promoted across campus to increase PA levels of university students (Lee & Buchner, 2008). This is important because a decline in PA participation has been observed when young adults attend university (Leslie, Sparling & Owen, 2001).

The results indicated that 85.7% of students living on campus go on a leisure walk at least once a week (Appendix D, Figure 3). This is congruent with previous literature which indicates that walking is a popular activity among university students (Griffiths et al., 2020). Furthermore, 90% of participants use walking as their main mode of transportation on campus (Appendix D, Figure 4). This finding is bolstered by the response to the question “Whenever possible, I aim to walk instead of using a bus or car”, which had an average score of 3.5 out of 5 (Appendix D, Table 6). Together, this suggests that UBC students who currently live on campus have implemented and maintained strategies to integrate walking into their daily routines.

Students’ Perceptions of Walking:

Participants scored 4.3 out of 5 when presented with the statement “I enjoy walking on campus”, and 4.0 out of 5 when presented with the statement “I enjoy going on walks around campus between classes or when I don’t have somewhere to be”, indicating that in general, current UBC students living on campus enjoy walking on campus (Appendix D, Table 7). This

intrapersonal enjoyment of walking suggests that campus initiatives aimed at promoting walking on campus will be well received by most students. Furthermore, these findings justify the importance of improving access to enjoyable walking spaces across campus as it has been identified that many students currently living on UBC's campus already participate. Future research should be conducted to identify what it is specifically that students find enjoyable about walking on campus, in order to make evidence-based recommendations tailored to those specific findings. This would maintain the favourable walking behaviors of students who currently participate in regular walking behaviours on campus, while also enticing those who indicated having less favourable walking behaviours such as the 14.3% of students who reported "never" going on regular leisure walks.

The participants also generally agreed with the statement, "There are long term mental health benefits to walking", scoring on average 4.5 out of 5 (Appendix D, Table 9). This widespread awareness regarding the mental health benefits of walking is a critical finding when working with university students for health promotion. According to Carballo-Fazanes (2020), the time that most university students spend sedentary, either studying or in front of computers, places them at a high risk of adopting long-term sedentary behaviours (Carballo-Fazanes, 2020). Additionally, sedentary behaviour has been associated with higher rates of mental health disorders such as depression, anxiety, as well as poorer overall quality of life, and a negative perception of one's own health (Carballo-Fazanes, 2020). Therefore, students' perceptions of the positive relationship between walking and mental health is encouraging as it demonstrates that they have sustained this knowledge after learning it and were able to recall it when asked. It may also imply that providing students with reminders of these health benefits would encourage students to walk more on campus.

Physical Health Benefits:

Our study indicated that although most students were aware of the positive mental health benefits of regular walking such as improved mood, less was known about the physical health benefits such as increased bone strength and cardiovascular endurance (Hardman, 1997; Kelly et al., 2018) (Appendix D, Figure 5). Furthermore, it may be less known that walking is a form of moderate-intensity PA (Griffiths et al., 2020). This notion was illustrated when participants scored 3.0 out of 5 on average when presented with the statement “Because walking is not an effective form of physical activity, I prefer to engage in higher intensity exercise instead” (Appendix D, Table 10). Therefore, it may be of importance to increase students’ knowledge of the physical health benefits of walking and to promote it as a mode of PA that can be integrated into a daily routine.

Barriers - Perceptions of Safety:

This study assessed students’ perceptions of safety as an indicator of their motivation to engage in regular walking on campus. According to Millstein and Halpern-Felsher (2002), individuals’ beliefs about the consequences of their actions and perceptions of their vulnerability play a key role in behaviour change and modification. This is further supported by the theory of planned behaviour (TPB) by looking at the students’ intention to participate in walking while also identifying the constructs that may be out of their individual control (Ajzen, 1991). Furthermore, students’ perceptions were critical to consider when asking how walking on campus can be promoted (Ajzen, 1991). This is important as behaviour is dependent on the intent to engage, which is in turn dependent on favourable attitudes and norms from the environment (Ajzen, 1991).

Barrier - Gendered Experiences of Safety:

It was found that students typically felt very safe while walking on campus during the day but when asked about walking in the evening and nighttime, students felt more unsafe. This was heightened in females who scored 2.4 out of 5 compared to 4.3 in males and 4 in the participant who identified as other (Appendix D, Table 12). Thus, gender has been identified as an interpersonal barrier to walking in the evening. This is congruent with the findings from Thomas and colleagues (2019), which state that males and females experience differing interpersonal barriers for participating in PA. Similarly, women walking alone at night is typically labelled as unsafe in society and therefore, not a positively reinforced behaviour for women compared to men (Ngo et al., 2014). When asked what the university could do to increase students' walking behaviours, many students indicated that more safety approaches such as lights and security measures should be considered (Appendix D, Table 14). Therefore, initiatives to increase perceived safety may be instrumental in promoting walking behaviours.

Structural Barriers:

Previous research has indicated that walking is considered safe and readily accessible (Morris & Hardman, 1997; Ogilvie et al., 2007). Contrastingly, our findings suggest that safety infrastructure and measures may be lacking as students have expressed concerns regarding perceived safety while walking on campus. For instance, lighting was reported by 5 participants as a significant barrier to walking on campus (Appendix D, Table 14). Additionally, many students reported that they would be more likely to go walking on campus if there were more safety measures in place (Appendix D, Table 14). Similarly, Ngo and colleagues (2014) highlighted in their study on perceptions of safety on the UBC Vancouver campus that lighting was identified as a major concern. These included poor lighting along the Greenway, Thunderbird Drive, East Mall Loop, existing crosswalks, and along the perimeters of forested

areas (Ngo et al., 2014). These findings indicate that the environment shapes how individuals perceive their safety and in turn, their motivation to go walking on campus.

Limitations

Extraneous Variables:

While investigating the walking behaviours of current UBC students living on campus, a limitation was not looking into variables such as students' socioeconomic status (SES) or race, as these could potentially influence the reporting bias and validity of our findings (Millstein & Halpern-Felsher, 2002; Ngo et al., 2014). Those with lower SES may be more likely to bypass their fears compared to those of higher SES who may have the privilege of going for leisure walks in the day and therefore, do not have to walk in the evening out of necessity (Griffiths et al., 2020). Furthermore, using the TPB to guide our analysis could compound our limitation as it does not account for individual and emotional states (Ajzen, 1991). It has also been identified by Millstein & Halpern-Felsher (2002), that those of racial or ethnic differences may experience varied perceptions of safety and risk. Therefore, not accounting for these demographic variables may influence the overall validity of our study

Crime Rates:

It is important to acknowledge that this study did not directly analyze crime rates on campus and therefore, cannot infer that participants' safety concerns are rationalized in this context. Similarly, we are unable to contribute to previous research which suggests that walking is a safe and readily accessible form of PA (Morris & Hardman, 1997; Ogilvie et al., 2007). This limitation does not influence the validity of our findings because regardless of the crime rates on campus, students' perceived safety on campus should not be ignored. Furthermore,

recommendations from this study must be brought forth to make people feel safe on campus and promote long-term healthy walking behaviours.

Survey Validity:

Due to the COVID-19 pandemic and the safety protocols in place, an online survey was the most feasible method of data collection. It also allowed us to engage with more students over social media to draw our findings from a larger sample size. However, conducting a survey may inevitably present limitations. The questions and select all answers provided on the survey were informed by previous literature and therefore participants were not able to provide meaningful explanations or further context to their answers. We addressed this limitation by providing text box options, however, many participants bypassed these. Therefore, interviews may be a reasonable data collection method in the future to investigate students' intrapersonal, interpersonal and structural barriers to regular walking on campus.

Another limitation of our survey may also be in part by response bias from participants. One of the ways this was identified in the analysis of our data was through gendered differences of perceived safety. Our survey found that females scored 2.4 out of 5 compared to 4.3 in males and 4.0 in the participant who identified as other (Appendix D, Table 12). This may be due to masculine social norms and pressures that prevent males from admitting heightened perceptions of fear while walking on campus in the evening or night (Ngo et al., 2014).

Lastly, it may be beneficial to account for female students' walking behaviours at night by asking what time of day participants are most likely to walk on campus to then see if those females who have higher perceptions of vulnerability still walk in the evening and for what reasons. This will provide insight as to how many students actually enjoy walking in the evening

and night, despite perceived safety concerns to identify how many students would actually benefit from structural recommendations such as additional lights and blue phones.

COVID-19:

This survey took place during the COVID-19 pandemic when in-person classes at the university were not running and when many students were not living or utilizing services on-campus. This may be a limitation to our overall study as walking behaviours may be more or less frequent and less students were available to partake in the survey. Our study may have consisted of a larger sample if the university was running at regular capacity.

Future Recommendations

To promote walking on campus as a form of PA, 4 key themes for recommendations have been identified from our findings. This includes the long-term recommendation of improving the existing infrastructure on campus to better support students' perceived safety and willingness to walk, immediately actionable recommendation of educating first-year students on the benefits of walking, and further developing the current UBC walking initiatives. Lastly, we will provide recommendations for future research to improve the validity and nuance of our initial question.

Campus Infrastructure:

According to our findings, rather than promoting more walking on campus where students may feel unsafe in the evening and night, it may be of importance to first increase students' positive perceptions of safety and then work to promote sustainable walking behaviours. This may be improved by further developing the safety infrastructure on campus. As identified in our findings, a concern that students had while walking on campus was a perceived lack of safety. One of the ways this may be approached is by installing more blue phones in areas where they are currently less dense.

Another recommendation may be improving and increasing the lighting across campus, specifically on streets that diverge from main mall. According to Ngo and colleagues (2014), better lighting cultivates a feeling of safety which is crucial for the overall experience of safety as more people are walking in an area, the safer it will be.

Education:

Highlighted from our data, the physical health benefits of walking seem to be less known. As indicated in our survey, participants scored on average 3.8 out of 5 when presented with the statement “I do not consider walking as a mode of exercise/physical activity” and 3.0 when presented with the statement “Because walking is not an effective form of physical activity, I prefer to engage in higher intensity exercise instead” (Appendix D, Table 10). Therefore, our next recommendation is in the form of education. According to Carballo-Fazanes (2020), those who received physical education in school were more likely to demonstrate enthusiasm for PA later in life. Therefore, if university students have the opportunity to learn about walking, they may be more enthusiastic to continue to participate in walking behaviours into their adult lives. As showcased in our data, there are knowledge gaps among the participants regarding the benefits of walking, specifically, its physical health benefits. Based on this finding, it may be beneficial to incorporate knowledge about the physical and mental health benefits of walking into all core courses, regardless of faculty or school. This would ensure that all students attending UBC will be educated on the benefits of walking, minimising the aforementioned knowledge gaps in students attending the university.

Improve UBC’s Walking Initiatives:

One of the strategies that the university has implemented to address safety and walking concerns was through the Alma mater society (AMS) *Safewalk* program which is a campus

safety initiative for students to call if they are walking alone at night and wish to be escorted to their destination (AMS Safewalk, 2020; Ngo et al., 2014). Although our study did not directly analyze current UBC walking initiatives such as *Safewalk*, it is unknown whether having these programs on campus influence students' overall perceptions of safety. However, it is important to acknowledge that even with these programs currently on campus, many students still feel unsafe in the evening and night. Therefore, it may be of interest for our partners to build upon current UBC walking programs such as AMS *Safewalk* to increase students' overall perception of safety. One of the ways this may be executed is by conducting a campus-wide study to understand students' concerns and build strategies through *Safewalk* to address them.

Conclusion

As this study was part of a new SEEDS priority to foster an inclusive, place-based, and resilient community by promoting more walking on campus, the results may provide insight for future research as well as provide the university partners with evidence-based recommendations (UBC SEEDS, 2021). Findings demonstrate that perceived safety, infrastructure, time, and motivation to be the key barriers for students. In addition, another major finding was that the participants demonstrated knowledge gaps regarding the physical benefits of walking. We recommend that SEEDS UBC take these findings and implement them into initiatives that promote walking on campus as well as long-term walking behaviours into adulthood.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.
- AMS Safewalk. (2020). <https://www.ams.ubc.ca/student-services/safewalk/>
- Blair, S. N. (2009). Physical inactivity: The biggest public health problem of the 21st century. *British Journal of Sports Medicine*, 43(1), 1-2.
- Bray, S. R., & Born, H. A. (2004). Transition to university and vigorous physical activity: Implications for health and psychological well-being. *Journal of American College Health*, 52(4), 181-188.
- Callaghan, P. (2004). Exercise: A neglected intervention in mental health care? *Journal of Psychiatric and Mental Health Nursing*, 11(4), 476-483. <https://doi.org/10.1111/j.1365-2850.2004.00751.x>
- Canadian Society for Exercise Physiology. (2011). Canadian Physical Activity Guidelines. Cited from: https://www.csep.ca/CMFiles/Guidelines/CSEP_PAGuidelines_adults_en.pdf
- Carballo-Fazanes, A., Rico-Díaz, J., Barcala-Furelos, R., Rey, E., Rodríguez-Fernández, J. E., Varela-Casal, C., & Abelairas-Gómez, C. (2020). Physical activity habits and determinants, sedentary behaviour and lifestyle in university students. *International Journal of Environmental Research and Public Health*, 17(9), 3272.
- Clarke, J., Colley, R., Janssen, I., & Tremblay, M. S. (2019). Accelerometer-measured moderate-to-vigorous physical activity of Canadian adults, 2007 to 2017. *Health Reports*, 30(8), 3-10. <https://www.doi.org/10.25318/82-003-x201900800001-eng>

- Griffiths, K., Moore, R., & Brunton, J. (2020). Sport and physical activity habits, behaviours and barriers to participation in university students: an exploration by socio-economic group. *Sport, Education and Society*, 1-15.
- Kelly, P., Williamson, C., Niven, A. G., Hunter, R., Mutrie, N., & Richards, J. (2018). Walking on sunshine: Scoping review of the evidence for walking and mental health. *British Journal of Sports Medicine*, 52(12), 800-806.
- Lee, I. M., & Buchner, D. M. (2008). The importance of walking to public health. *Medicine & Science in Sports & Exercise*, 40(7), S512-S518.
- Leslie, E., Sparling, P. B., & Owen, N. (2001). University campus settings and the promotion of physical activity in young adults: Lessons from research in Australia and the USA. *Health Education (Bradford, West Yorkshire, England)*, 101(3), 116-125.
<https://doi.org/10.1108/09654280110387880>
- Millstein, S. G., & Halpern-Felsher, B. L. (2002). Perceptions of risk and vulnerability. *Journal of Adolescent Health*, 31(1), 10-27.
- Morris, J. N., & Hardman, A. E. (1997). Walking to health. *Sports Medicine*, 23(5), 306-332.
- Nederhof, A. J. (1985). Methods of coping with social desirability bias: A review. *European Journal of Social Psychology*, 15(3), 263-280.
- Ngo, V. D., Lefrançois, C. B., Keating, J., Fineblit, E., Herod, M., De Sousa, S., & James, R. (2014). Perceptions of Safety in UBC Campus Public Spaces: The case of the university neighbourhoods association (Doctoral dissertation, University of British Columbia).
- Ogilvie, D., Foster, C. E., Rothnie, H., Cavill, N., Hamilton, V., Fitzsimons, C. F., & Mutrie, N. (2007). Interventions to promote walking: A systematic review. *BMJ*, 334(7605), 1204.

Penedo, F. J., & Dahn, J. R. (2005). Exercise and well-being: A review of mental and physical health benefits associated with physical activity. *Current Opinion in Psychiatry*, 18(2), 189-193. <https://doi.org/10.1097/00001504-200503000-00013>

The University of British Columbia. (n.d.) *UBC Vancouver campus*. UBC.
<https://www.ubc.ca/our-campuses/vancouver/>

Thomas, A. M., Beaudry, K. M., Gammage, K. L., Klentrou, P., & Josse, A. R. (2019). Physical activity, sports participation, and perceived barriers to engagement in first-year Canadian university Students. *Journal of Physical Activity and Health*, 16(6), 437-446.

UBC SEEDS Sustainability Program. (2021). Cited from: <https://sustain.ubc.ca/teaching-applied-learning/seeds-sustainability-program>

Warburton, D. E. & Bredin, S. S. (2017). Health benefits of physical activity. *Current Opinion in Cardiology*, 32(5), 541–556. DOI: 10.1097/HCO.0000000000000437

World Health Organization. (2009). *Global health risks: Mortality and burden of disease attributable to selected major risks*. World Health Organization.

Appendix:

Appendix A Recruitment Materials

Social Media Post:


Hey UBC Students! As part of our coursework for KIN 464 (Health Promotion and Physical Activity), my group and I are conducting a survey to investigate walking behaviours on UBC's Vancouver campus.

The survey should take approx. 5 minutes to complete and you will be entered in a draw to win prizes. For more information you can check out our poster below or email ryan.alfonso@ubc.ca (we would love to hear from you)!

Thanks for reading!

Qualtrics survey link: https://ubc.ca1.qualtrics.com/jfe/form/SV_9MunADGchP2hANw

Recruitment Poster:



THE UNIVERSITY OF BRITISH COLUMBIA

School of Kinesiology
210-6081 University Boulevard
Vancouver, BC Canada V6T 1Z1

Phone 604 822 9192
Fax 604 822 6842
www.kin.ubc.ca

Kin 464: Health Promotion and Physical Activity Class-Based Project

As a part of a course-based research project (KIN 464), we are conducting a survey based study on promoting walking programs on campus.

Participants must be both:

- Currently enrolled in courses at the University of British Columbia Point Grey Campus
- Currently reside on the Point Grey campus.




Photo by Arek Adeoye on Unsplash

Survey link:
https://ubc.ca1.qualtrics.com/jfe/form/SV_9MunADGchP2hANw

Upon completion of the survey participants will be entered in a draw for 2 \$25 gift cards to the UBC Bookstore or Food Services and 1 Fitbit!

For more information, please contact ryan.alfonso@ubc.ca

The principal investigator for this research is Dr. Andrea Bundon
(andrea.bundon@ubc.ca)

Appendix B Consent Forms

CLASS PROJECT: Health Promotion and Physical Activity (KIN 464)

Participant Consent Form

[Promoting walking programs]

[Group 12 (F) (S)]

Principal Investigator:

Dr. Andrea Bundon (Assistant Professor, School of Kinesiology, Faculty of Education)

The purpose of the class project:

To gather knowledge and expertise from community members on the topic of promoting walking programs on UBC's campus.

Study Procedures:

With your permission, we are asking you to participate in this survey. You may only complete the survey once

With the information gathered, students will critically examine how different individuals understand or engage in health promoting activities or health promotion initiatives.

Project outcomes:

The information gathered will be part of a written report for the class project. The written report will be shared with campus partners involved with the project. Summaries of findings will also be posted on the following websites. *No personal information/information that could identify participants will be included in these reports or shared with campus partners.*

UBC SEEDS Program Library:

<https://sustain.ubc.ca/courses-degrees/alternative-credit-options/seeds-sustainability-program/seeds-sustainability-library>

Potential benefits of class project:

There are no explicit benefits to you by taking part in this class project. However, the interview will provide you with the opportunity to voice your opinion on your experiences with health promoting activities or initiatives in a broad sense and will provide the students with an opportunity to learn from your experiences.

Confidentiality:

Maintaining the confidentiality of the participants involved in the research is paramount, and no names of participants will be collected.

At the completion of the course, all data (i.e. notes) and signed consent forms will be stored on a secure electronic drive by Dr. Bundon. All data and consent forms will be destroyed 1 year after completion of the course.

Risks:

The risks associated with participating in this research are minimal. There are no known physical, economic, or social risks associated with participation in this study. You should know

that your participation is completely voluntary and you are free to **withdraw from the study** and there will not be negative impacts related to your withdrawal. If you withdraw from the study, all of the information you have shared up until that point will be destroyed.

Contact for information about the study:

If you have any questions about this class project, you can contact Andrea Bundon by phone at 604-822-9168 or by email at andrea.bundon@ubc.ca

Research ethics complaints:

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or e-mail RSIL@ors.ubc.ca . or call toll free 1-877-822-8598.

Consent:

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time.

Do you consent to participate in this study?

Appendix C

Survey Questions

CLASS PROJECT: Health Promotion and Physical Activity (KIN 464)

Participant Consent Form

[Promoting walking programs]
[Group 12 (F) (S)]

Principal Investigator:

Dr. Andrea Bundon (Assistant Professor, School of Kinesiology, Faculty of Education)

The purpose of the class project:

To gather knowledge and expertise from community members on the topic of promoting walking programs on UBC's campus.

Study Procedures:

With your permission, we are asking you to participate in this survey. You may only complete the survey once

With the information gathered, students will critically examine how different individuals understand or engage in health promoting activities or health promotion initiatives.

Project outcomes:

The information gathered will be part of a written report for the class project. The written report will be shared with campus partners involved with the project. Summaries of findings will also be posted on the following websites. *No personal information/information that could identify participants will be included in these reports or shared with campus partners.*

UBC SEEDS Program Library:

<https://sustain.ubc.ca/courses-degrees/alternative-credit-options/seeds-sustainability-program/seeds-sustainability-library>

Potential benefits of class project:

There are no explicit benefits to you by taking part in this class project. However, the interview will provide you with the opportunity to voice your opinion on your experiences with health promoting activities or initiatives in a broad sense and will provide the students with an opportunity to learn from your experiences.

Confidentiality:

Maintaining the confidentiality of the participants involved in the research is paramount, and no names of participants will be collected.

At the completion of the course, all data (i.e. notes) and signed consent forms will be stored on a secure electronic drive by Dr. Bundon. All data and consent forms will be destroyed 1 year after completion of the course.

Risks:

The risks associated with participating in this research are minimal. There are no known physical, economic, or social risks associated with participation in this study. You should know that your participation is completely voluntary and you are free to **withdraw from the study** and there will not be negative impacts related to your withdrawal. If you withdraw from the study, all of the information you have shared up until that point will be destroyed.

Contact for information about the study:

If you have any questions about this class project, you can contact Andrea Bundon by phone at 604-822-9168 or by email at andrea.bundon@ubc.ca

Research ethics complaints:

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the UBC Office of Research Ethics at 604-822-8598 or e-mail RSIL@ors.ubc.ca or call toll free 1-877-822-8598.

Consent:

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from the study at any time.

Do you consent to participate in this study?

- Yes
 No

Do you live on campus at UBC?

- Yes
 No



How old are you?

What year are you currently in?

- Undergraduate First Year
- Undergraduate Second Year
- Undergraduate Third Year
- Undergraduate Fourth Year
- Undergraduate Fifth Year and above
- Masters
- Other

What Faculty/School are you in?

- Kinesiology
- Arts
- Science
- Engineering
- Sauder School of Business
- Music
- Forestry
- Land and Food Systems
- Other

How do you identify your gender?

- Male
- Female
- Non-binary / Third Gender
- Two-Spirit
- Other
- Prefer not to say



This is a reminder that all the data we collect is anonymous and we encourage you to answer these questions as truthfully as possible to give us accurate data. Thank you.

Are you aware of the Canadian Physical Activity Guideline of participating in 150 minutes of moderate to vigorous intensity aerobic physical activity per week?

- Yes
- No

In a typical week, I participate in 150 minutes of moderate to vigorous intensity aerobic physical activity.

- Always
- Most of the time
- About half the time
- Sometimes
- Never



What do you think are the barriers preventing you from always reaching this recommendation? (Check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Lack of time | <input type="checkbox"/> Physical limitations |
| <input type="checkbox"/> Lack of money | <input type="checkbox"/> I do not enjoy physical activity |
| <input type="checkbox"/> Lack of accessibility to fitness facilities | <input type="checkbox"/> Other (Please specify) |
| <input type="checkbox"/> Lack of motivation | <input type="text"/> |



Answer the following from strongly disagree to strongly agree

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Whenever possible I aim to walk instead of using a bus or car.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I prefer to take the bus from one end of campus to the other instead of walking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I do not consider walking as a mode of exercise/physical activity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe walking has benefits to my physical health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are NO long-term physical benefits from regular walking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I believe walking has benefits to my mental health.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are long-term mental health benefits from regular walking.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I only see walking as a form of transportation but not leisure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Because walking is not an effective form of physical activity, I prefer to engage in higher intensity exercise instead.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How often in a week do you go on a leisure walk when you don't have somewhere to be?

- Everyday
 Most days
 On a few days
 Once a week
 Never

Which of the following benefits do you believe are associated with walking? Check all that apply.

- Improved mood
 Improved cardiovascular endurance
 None of the above
 Other
 Increased bone strength

Why do you, or don't you go for walks?



Walking is my primary mode of transportation on campus

Yes

No (What is your primary mode of transport?)

How much do you agree with the following statements?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I enjoy walking on campus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel safe walking on campus during the day	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel safe walking on campus during the evening/night	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel safe walking on campus alone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoy going on walks around campus between classes or when I don't have somewhere to be.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Is there anything that the University could do, to increase your frequency of walking?



Do you have any additional comments?



Appendix D
Tables and Figures

Table D.1

Age	
Valid	42
Missing	0
Mean	21.048
Std. Deviation	1.873
Minimum	18.000
Maximum	28.000

Table D.2

Frequencies for Year of Study

Year	Frequency	Percent Valid	Percent Cumulative	Percent
Masters	3	7.143	7.143	7.143
Other	1	2.381	2.381	9.524
Undergraduate Fifth Year and above	4	9.524	9.524	19.048
Undergraduate First Year	6	14.286	14.286	33.333
Undergraduate Fourth Year	9	21.429	21.429	54.762
Undergraduate Second Year	5	11.905	11.905	66.667
Undergraduate Third Year	14	33.333	33.333	100.000
Missing	0	0.000		
Total	42	100.000		

Table D.3

Frequencies for Gender

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Female	29	69.048	69.048	69.048
Male	12	28.571	28.571	97.619
Other	1	2.381	2.381	100.000
Missing	0	0.000		
Total	42	100.000		

Table D.4

Frequencies for Faculty/School

Faculty/School	Frequency	Percent	Valid Percent	Cumulative Percent
Arts	7	16.667	16.667	16.667
Engineering	6	14.286	14.286	30.952
Forestry	1	2.381	2.381	33.333
Kinesiology	10	23.810	23.810	57.143
Land and Food Systems	1	2.381	2.381	59.524
Music	1	2.381	2.381	61.905
Other	2	4.762	4.762	66.667
Sauder School of Business	5	11.905	11.905	78.571
Science	9	21.429	21.429	100.000
Missing	0	0.000		
Total	42	100.000		

Table D.5

Frequencies for Awareness of Canadian PA guidelines of UBC students living on campus

Awareness of Canadian PA guidelines of UBC students living on campus	Frequency	Percent	Valid Percent	Cumulative Percent
No	17	40.476	40.476	40.476
Yes	25	59.524	59.524	100.000
Missing	0	0.000		
Total	42	100.000		

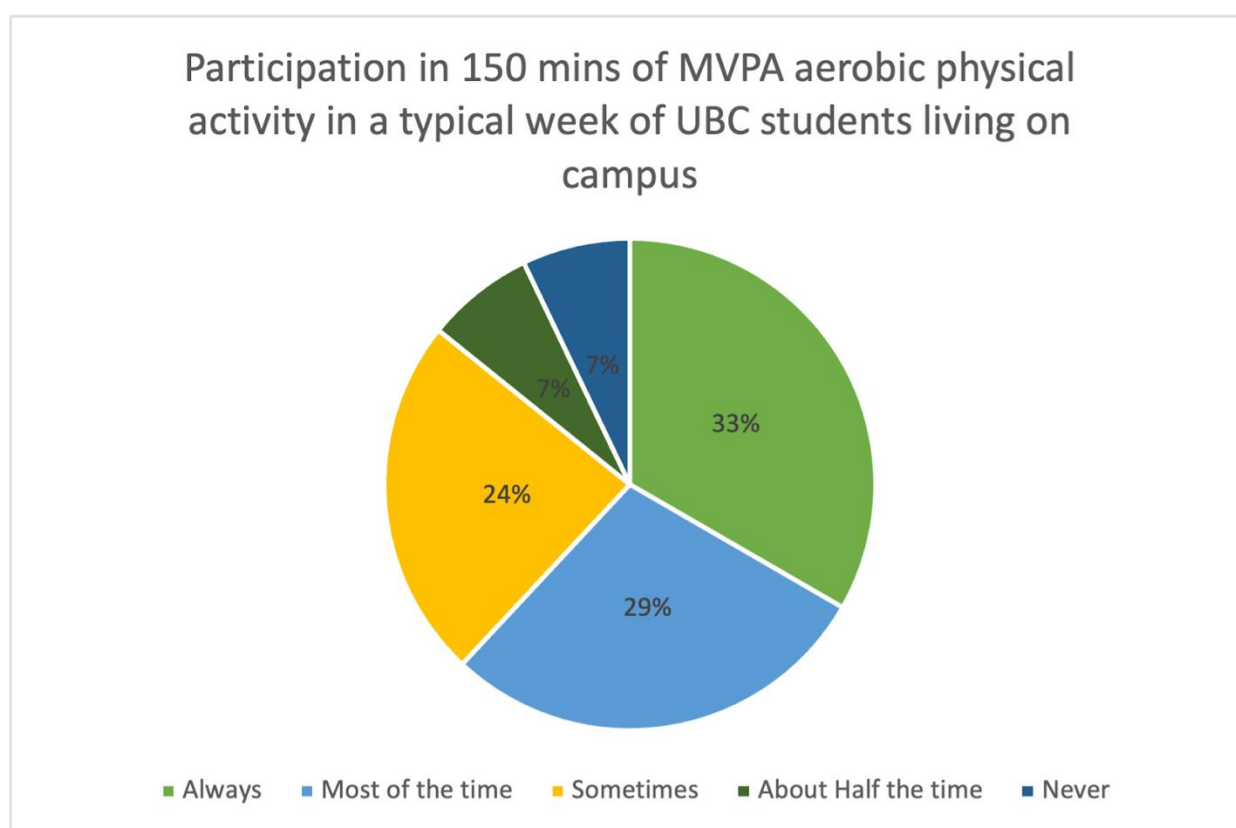


Figure D.1. Participation in 150 mins of Moderate-to-Vigorous Physical Activity (MVPA) aerobic physical activity in a typical week of UBC students living on campus.

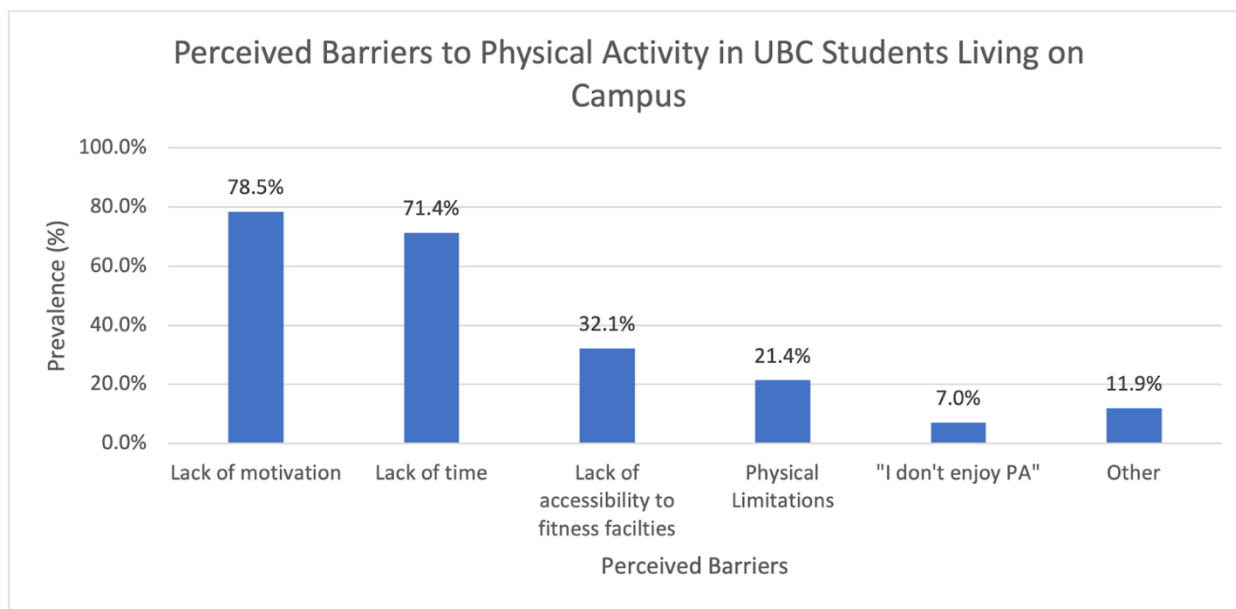


Figure D.2. Perceived Barriers to Physical Activity in UBC Students Living on Campus.

*Other factors reported were “COVID-19 restrictions, being embarrassed and an introvert, mental health issues, and having multiple injuries and health problems.”

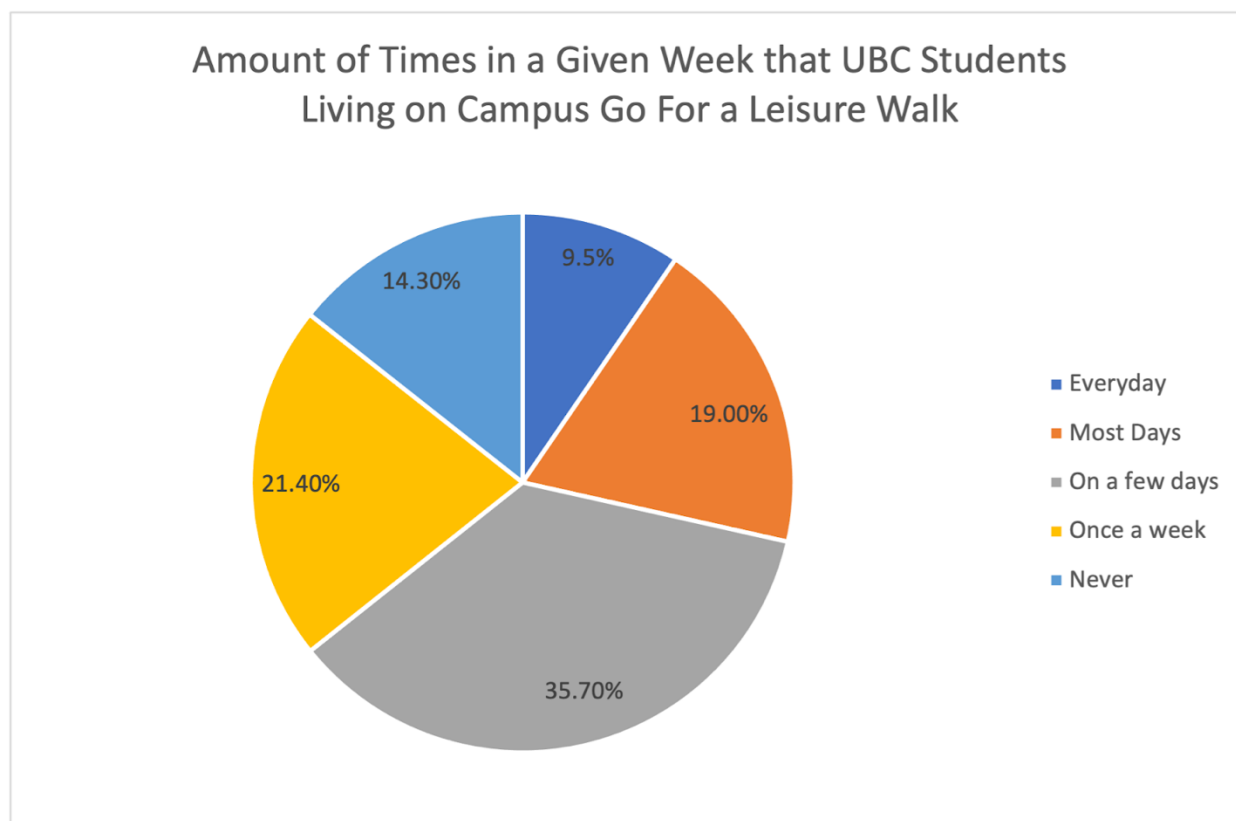


Figure D.3. Amount of Time in a Given Week that UBC Students Living on Campus go for a Leisure Walk.

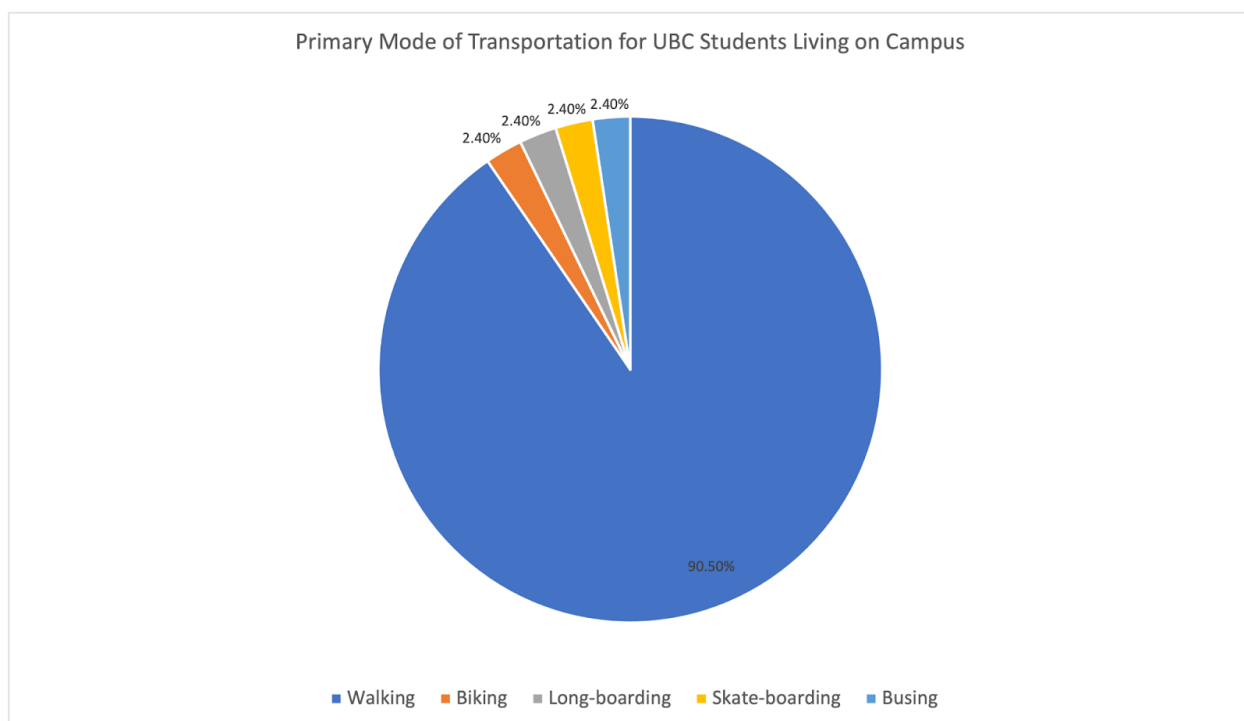


Figure D.4. Primary Mode of Transportation for UBC Students Living on Campus.

Table D.6.

	Responses to “Whenever possible I aim to walk instead of using a bus or car”	Responses to “I prefer to take the bus from one end of campus to the other instead of walking”
Valid	42	42
Missing	0	0
Mean	3.548	3.857
Std. Deviation	1.109	1.221
Minimum	1.000	1.000
Maximum	5.000	5.000

Table D.7.

	Responses to “I enjoy walking on campus”	Responses to “I enjoy going on walks around campus between classes or when I don't have somewhere to be”
Valid	42	42
Missing	0	0
Mean	4.286	4.024
Std. Deviation	0.891	1.047
Minimum	2.000	1.000
Maximum	5.000	5.000

Table D.8

	Responses to “I believe walking has benefits to my physical health”	Responses to “I believe walking has benefits to my mental health”
Valid	42	42
Missing	0	0
Mean	4.643	4.619
Std. Deviation	0.577	0.539
Minimum	3.000	3.000
Maximum	5.000	5.000

Table D.9

	Responses to “There are NO long-term physical health benefits of walking”	Responses to “There are long-term mental health benefits to walking”
Valid	42	42
Missing	0	0
Mean	4.786	4.524
Std. Deviation	0.606	0.671
Minimum	2.000	3.000
Maximum	5.000	5.000

Table D.10

	Responses to “I do not consider walking as a mode of exercise/physical activity”	Responses to “Because walking is not an effective form of physical activity, I prefer to engage in higher intensity exercise instead”
Valid	42	42
Missing	0	0
Mean	3.833	2.976
Std. Deviation	1.228	1.316
Minimum	1.000	1.000
Maximum	5.000	5.000

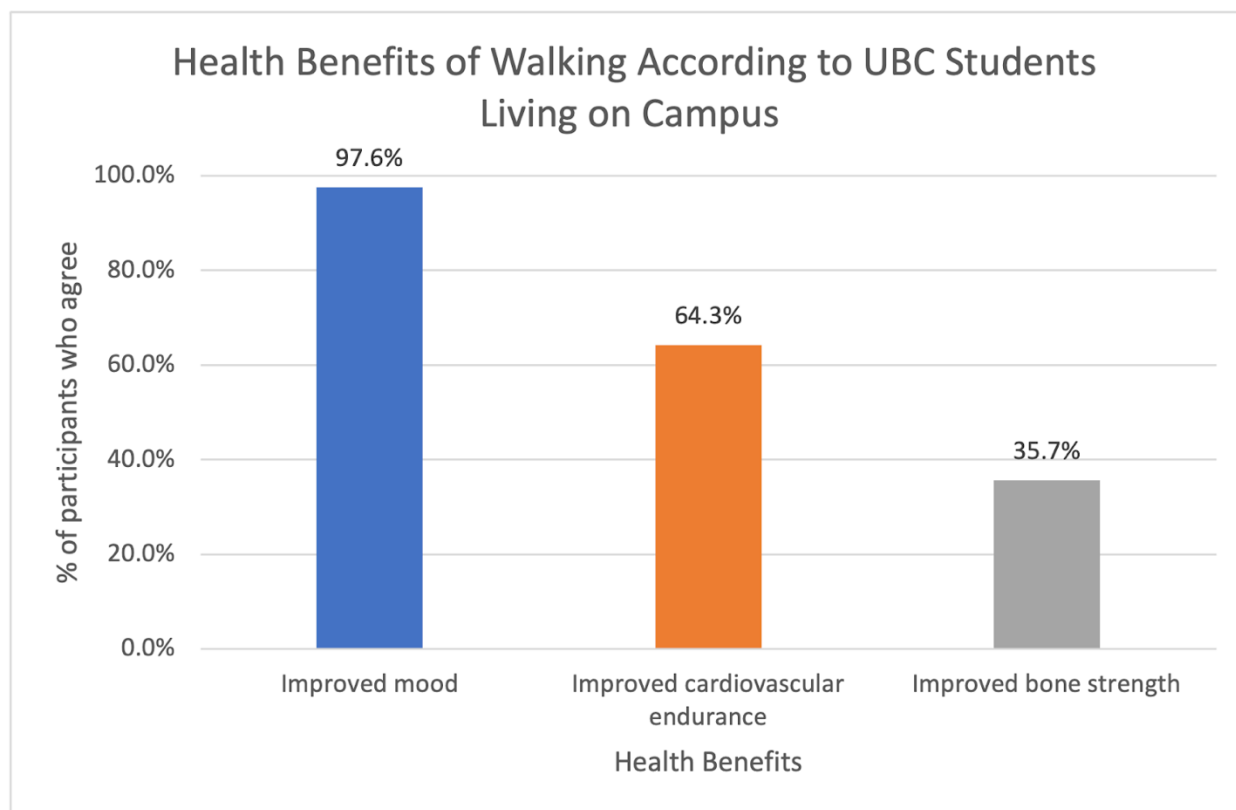


Figure D.5. Health Benefits of Walking According to UBC Students Living on Campus.

Table D.11

	Perception of safety walking on campus during the day of UBC students living on campus	Perception of safety walking on campus in the evening/night of UBC students living on campus	Perception of safety walking alone on campus of UBC students living on campus
Valid	42	42	42
Missing	0	0	0
Mean	4.357	2.952	3.524
Std. Deviation	0.850	1.361	1.292
Minimum	2.000	1.000	1.000
Maximum	5.000	5.000	5.000

Table D.12

	Perception of safety walking on campus in the evening/night of female UBC students living on campus	Perception of safety walking on campus in the evening/night of male UBC students living on campus	Perception of safety walking on campus in the evening/night of UBC student living on campus who identified as other
Valid	29	12	1
Mean	2.379	4.250	4.000
Std. Deviation	1.208	0.622	NA
Minimum	1.000	3.000	4.000
Maximum	5.000	5.000	4.000

Table D.13

	Perception of safety walking on campus alone of female UBC students living on campus	Perception of safety walking on campus alone of male UBC students living on campus	Perception of safety walking on campus alone of UBC student living on campus who identified as other
Valid	29	12	1
Mean	3.138	4.417	4.000
Std. Deviation	1.274	0.900	NA
Minimum	1.000	2.000	4.000
Maximum	5.000	5.000	4.000

Table D.14

Responses to “What can the university do to increase your frequency of walking?”	Themes
Increasing lighting in darker areas of campus/making sidewalks wider	Lighting
Potentially have better lighting so I feel safer walking on campus at night	
More lighting in some areas, especially on NW Marine Drive	
Put more lights	
More lights, safety approaches	
Put security guards around at night	
More security at night for girls who feel unsafe	
Safer culture.	
Increase safety	
Increase feeling of safety and security	
have it be safer during evening hours	
Ensure the walking paths are even/free of hazards, make the walks less complicated by not blocking areas off for construction	
Make good lanes for bikes (recently some were added) to keep bikes from the most narrow sidewalks.	
Plant more flowers around campus	

More Indigenous artwork on display around campus	Campus Programs & Infrastructure
Have better food joints	
Set up walking routes with a map that would take you to different parts of campus. Could have a historical route to show off different buildings.	
Group walking clubs or interactive programs?	
In person classes	Classes-related factors
Go back to in-person classes, but safety first	
Incorporate walking into science curriculum	

Table D.15. Reasons Participants Report Walking.

Reasons participants report walking	Mental Health	Physical Health	Nature/ Fresh air	Social Connection	Other
To be active daily for physical and mental health. Because it's energizing. To connect with nature	x	x	x		
Mental/physical health	x	x			
I need a purpose to go for a walk					x
Consider this as a form of exercise, and don't run much on treadmill/regular roads due to past knee surgery. And don't use gym too much due to Covid		x			
Makes me feel accomplished, as if I'm getting something done. I love the fresh air, but I have a knee limitation that causes extreme pain, so walking for extended periods of time is difficult			x		
Walking provides mental clarity for me.	x				
It depends on if I have plans or not, the weather, my anxiety	x				
Fresh air and to help with my anxiety/ remove myself from screen time	x		x		
it's relaxing and it's a time to unplug	x				

I mostly go for walks when I catch up with friends.				x	
I go for walks from extreme zoom fatigue! I love getting outside and feeling the fresh air			x		
I go for walks mainly because it improves my mental health and is a great way to catch up with a friend during the pandemic.	x			x	
Walks give me a good time to enjoy listening to music with less distractions					x
It's good to get outside and out of my room once in a while.					x
I struggle with agoraphobia and don't have a car to get off campus, even during covid the UBC campus is so populated that walking outside causes me a great deal of anxiety most days	X				
Clears my mind	x				
They are calming and allow me to clear my head	x				
Only really walk when I need to					x
I've been doing it especially since the pandemic.					x
Makes me happy	x				

I go on walks because I enjoy the fresh air, and the scenery.			x		
get out of my house, take a smoke break					x
I do it cause the weather is just so good. Except when it rains. I get sad when it rains cause I can't walk					x
My mental health	x				
I go for walks as it helps me get fresh air and feel relaxed	x		x		
I started in January and it quite literally cured my depression so I am extremely in favor of participating in usual walks.	x				
I'm under lockdown right now but I usually go for runs but anything that gets me moving I will do		x			
When I have time, it's nice to walk around and talk with a friend without a specific goal for the conversation, it forces us to take a break from study. I like getting fresh air and clearing my mind.	x		x	x	
I go for walks so I can take a break and clear my head by getting fresh air	x		x		
I go for walks when I need some fresh air, or when I want to clear my head	x		x		

I like fresh air			x		
To clear my head	x				
i like to listen to music and it's fun					x
Clear my head	x				
For exercise, to clear mind, to view scenery, etc.	x	x	x		
For fun/to run errands					x
For my mental health	x				

Table D.16. Reasons Participants Report Not Walking

Reasons participants report not walking	Lack of Time	Not enjoying exercise	Prefer other PA	Physical Limitations
Because I feel like I don't have enough time. I tend to prefer to get a high intensity workout when I have time, and I tend to walk only when it's faster than bussing.	x		x	
Lack of free time	x			
I am lazy and exercising sucks		x		
I'm lazy, and I prefer weight training for exercise			x	
Walking no give me gains			x	
Makes me feel accomplished, as if I'm getting something done. I love the fresh air, but I have a knee limitation that causes extreme pain, so walking for extended periods of time is difficult				x