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Walking Programs and Walkability at UBC Vancouver

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EXECUTIVE SUMMARY

Walking is a great form of physical activity that bestows a variety of social, environmental, physical, and psychological benefits upon an individual. Despite all of these benefits that walking brings, there tends to be a decline in walking rates among college and university students. Some common reasons involve not seeing walking as enough of an intensity to bring on physical health benefits, choosing more convenient forms of transportation from a time and energy conservation standpoint, and being a part of a physical environment that provides barriers to walking amongst this demographic. All of these reasons have led to increasing sedentary levels in post secondary students, especially while on campus.

The purpose of this study was to evaluate undergraduate students' perceptions of UBC Recreation's existing walking programs and explore the motivations, reasons, and perceptions for walking among this demographic. Recommendations will be provided to help improve the existing walking programs and the overall walkability of the UBC Vancouver campus.

This study was conducted through online surveys using Qualtrics from March 24th to April 5th, 2021. The survey consisted of mainly quantitative questions and a couple of qualitative questions. The survey included 31 questions which were broken down into four parts: individual's background information, attitudes and motivations towards walking, walkability of the UBC Vancouver Campus, and perceptions of Move UBC's walking programs. The survey was distributed to UBC undergraduate students through social media platforms such as Facebook and Instagram.

The most common barriers that participants can control to walking that came out of our research questions were time conflict, not viewing walking as an effective behaviour for improving physical fitness, lack of social interactions, poor lighting on campus, and a general lack of knowledge regarding the different walking programs that are offered by UBC Recreation. All of these potential barriers are encompassed in the socioecological model of promoting health behaviours. It takes the majority of our participants at least 30 minutes to travel to campus and also engage in active transportation (e.g. public transit, walking, biking), yet they remain sedentary for long periods throughout the day, which highlights the work that's needed to be done on campus to promote more walking.

As a result of our findings, we offer the following recommendation to improve walking on campus: to improve safety concerns in the dark by improving lighting in certain areas. We offer the following two recommendations to improve the currently existing walking programs at UBC Vancouver: to create a class based incentive system, and to specialize walking programs for specific faculties. We offer the following recommendation to guide future research involving this topic: to analyze how the COVID-19 Pandemic will influence students' walking habits as they return to a crowded social campus environment.

INTRODUCTION AND LITERATURE REVIEW

Physical inactivity is a significant public health concern, especially among university students (Jackson & Howton, 2008). There are noted declines in activity levels as students enter university and again directly following graduation (Jackson & Howton, 2008). According to the UBC Wellbeing Annual Report 2019-20 (2020), 45% of undergraduate students located at UBC Vancouver report not meeting the Canadian physical activity guidelines. College students need to be informed about the benefits of exercise early in college as what they do will determine their habits for the rest of their lives (Eichorn et al., 2018). Therefore, increasing physical activity during university is important as this is a transitional period in which physical activity seems to decline. Walking is a universal, convenient, and familiar form of physical activity that has a diverse range of health benefits and a low risk of injury (Bang et al., 2017). A common theme in the walkability literature is the notion that many university students remain sedentary as they perceive light activity such as walking to be futile (Pachu et al., 2020). Additionally, transportation seems to be a significant barrier to walking as many students continue to use other modes of transportation to and from school as students view walking as taking more time, and so it is inconvenient for this demographic as they have busy school and work schedules (Kaplan, 2015). Walkability of an environment also needs to be considered to encourage walking while keeping people safe. Walkability is defined here as the safety, desirability, and accessibility of a specific setting (King et al., 2020). UBC Recreation offers many walking initiatives, such as Walk for Joy and Wellbeing Walks, to get people on campus walking more. However, many people may not be aware of the programs and resources that are being offered and their benefits.

Attitudes of Walking for Reducing Sedentary Behaviour

Given the numerous barriers to exercise that university students face (e.g. lack of time, motivation, cost, equipment), the literature suggests that reducing sedentary behaviour amongst this population may be more achievable compared than increasing moderate to vigorous exercise, as reducing sedentary behaviour poses fewer barriers (Pachu et al. 2020). Sedentary behaviour is characterized by any walking activity involving energy expenditure ≤ 1.5 metabolic equivalents while sitting, lying, or reclining (Pachu et al. 2020). A systematic review of 23 studies found that undergraduate students across seven countries experience 10-11 hours of sedentary activities per day (Pachu et al. 2020). Evidence presented in the literature has shown that breaking up extended periods of sitting (~30 min) with light-intensity activities, such as walking, can mitigate some of the cardiometabolic risks of sedentary behaviour (Pachu et al. 2020). Further, walking is a less arduous activity that requires less preparation than what is required for more vigorous physical activity.

Rebar et al. (2014) assert that university students typically walk as a means to achieve a goal other than PA (e.g. transportation) that involve more moderate to vigorous (i.e. higher intensity) activities. Moulin & Irwin's (2017) study on Canadian university students concluded that many students may not know the difference between sedentary behaviour (i.e. sitting or laying while awake) and physical inactivity (cessation of PA oriented behaviour). Most participants indicated that access to recreational facilities aided in their ability to become less sedentary (Moulin & Irwin, 2017). Similarly, in their qualitative study, Pachu et al. (2020) found that, although many students were confident that they could reduce sedentary behaviour, they were unlikely to change. They found that students considered breaking up sedentary behaviour with light activity "was not a priority... would provide meaningless health benefits... and [indicated that] class schedules/norms/infrastructure promote sitting and are not under their

control to change” (Pachu et al. 2020, p. 5). In their prospective cohort study, Rebar et al. (2014) suggested that focusing on activities of lower intensity (e.g. walking) may help bridge this ‘intention-behaviour’ gap thus improving the effectiveness of intention enhancing physical activity interventions. Traditional walking interventions have had limited success potentially because of their focus on the enhancement of intention, however, the literature suggests light activities such as walking may be regulated by different processes, such as habit formation that regulate unintentional behaviour (Rebar et al. 2014).

Transportation

According to Statistics Canada, only 22% of Canadian adults report using active modes of transportation such as walking or biking (ParticipACTION Report Card, 2019). Sustainable and active transportation represents an effective way of increasing physical activity, improving quality of life, and reducing emissions across many populations, especially university communities (Mundorf et al. 2018). Despite the benefits of active transportation, many university students continue to commute by vehicle (Mundorf et al. 2018). There is typically a lack of awareness of the health impacts of vehicle transportation as many view driving as a social norm (Mundorf et al. 2018). As part of the shift towards a more sustainable and healthy lifestyle for university students, finding ways to change transportation choices by emphasizing local and current threats, while providing sustainable and feasible options is crucial (Mundorf et al., 2018). Morency et al. (2014) found that changing short motorized trips to walking would allow for 8% of their study population to increase physical activity levels, potentially leading to fitness and weight management improvement. They concluded that this shift provides a valuable opportunity

to increase daily physical activity and might reduce weight gain at a population level (Morency et al. 2014).

According to Moulin & Irwin (2017), walking to and on campus was a significant facilitator to engaging in a less sedentary lifestyle, identified by their sample of Canadian university students. However, consistent with Statistics Canada, they found that 22% of students used walking as their main mode of transportation to and from school and this decreased as they advanced into later years of the study due to moving to off-campus residences. They asserted that the further students lived from campus, the more likely they were to turn to public transit as their main mode of transportation (Moulin & Irwin, 2017). The researchers noted that this may not necessarily mean that transit commuters were not active compared to those who walked. Mundorf et al. (2018) similarly suggested that public transit promotes walking as most riders walk to and from transit stops to their destinations. As the dominance of automobile transportation has been associated with negative impacts on community life, the promotion of walking (including public transportation) is likely to contribute to the efforts of meeting public health goals and building resilient student communities (Mundorf et al. 2018).

Walkability

Walkability is defined as the ability to quantify the desirability and safety of walking routes within a specific setting (King et al., 2020). Walkability is determined by environmental factors like street organization, safety, accessibility of specific destinations, but also how individuals perceive that environment (King et al., 2020). Although college/university campuses often are built in a way that should encourage physical activity through walkways, bikeways, and roadways, there has been an overall decrease in the amount of physical activity reported by

students and faculty throughout a majority of college campuses in the United States (King et al., 2020). The purpose of King et al.'s (2020) study was to gather qualitative data on the students' perceptions on the walkability of the campus. The researchers first did an environmental audit scan, in which they evaluated the infrastructures on the campuses (King et al., 2020). They found evidence pertaining to both ends of the spectrum. Some routes had a strong evaluation of walkability. For example, amongst the routes that were considered continuous, nearly 90% of them had sidewalks along both sides of the road, which makes accessibility easier (King et al., 2020). Also, 85% of sidewalks were free from permanent barriers like parking meters, trashcans, and light poles (King et al., 2020). Some routes had potential barriers to walking. For example, 15% of the Emergency Blue light systems on the routes were reported as being out of service, which could limit walking in the dark as a safety risk (King et al., 2020). Also, only 40% of intersections had yield signs, which makes it difficult for individuals to cross the street as cars often don't stop, according to the participants (King et al., 2020). Although the students generally perceive the campus built environment as one that encourages physical activity, they're also less likely to be aware of the term walkability or to see walking as a form of physical activity, which limits walking rates (King et al., 2020).

Purpose Statement

The purpose of this study was to evaluate undergraduate students' perceptions of UBC Recreation's existing walking programs and explore the motivations, reasons, and perceptions for walking among this demographic. Recommendations will be provided to help improve the existing walking programs and the overall walkability of the UBC Vancouver campus.

METHODS

Theoretical Framework

The questions developed for this study were based on the socioecological model. We used this framework to examine walking as a health related behaviour, and to understand the barriers that individuals often have to engage in this behaviour. Our study specifically focused on the intrapersonal, interpersonal, and environmental aspects of the model. We analyzed how intrapersonal factors influence individual's walking behaviours by asking "what are your perceptions of walking as a health related behaviour" and including individual factors such as exercise-related health benefits, psychological health benefits, and daily step count achievements. We asked "why individuals engage in walking" to find these intrapersonal factors. We wanted to determine if an intrapersonal barrier to engage in walking or a walking program was due to participants not viewing walking as an intense enough activity to acquire health benefits. We analyzed how interpersonal factors influence walking by determining if engaging in social activity with friends is a reason for why individuals engage in a walking program, and if preference for walking alone or with friends was a barrier for participating in walking programs.

One section in particular focused on walkability, and assessed how the physical environment at UBC Vancouver promotes or hinders engagement in walking. In terms of the positive aspects of the environment, we asked individuals if there was a specific route or location on campus that encourages individuals to walk more frequently (e.g. forested trails, sidewalks on both sides of the street). In terms of the negative aspects of the environment, we asked individuals if there was a specific route or location on campus that discourages individuals to walk frequently (e.g. poorly lit sidewalks, traffic). We asked questions about rating the walkability of sidewalks/crosswalks and the campus as a whole, but we also wanted to determine

how big of a risk factor the environment was towards the safety of an individual. We asked individuals to rate the safety of walking trails/roads after dark on campus, and to rate the safety of using sidewalks/crosswalks on campus in relation to vehicular and bike traffic. Additionally we asked for students' perceptions of enjoyment walking on campus and the accessibility of known walking routes with reference to proximity to their main building(s).

Data Collection

Data was collected through online surveys using Qualtrics from March 24th to April 5th 2021. Surveys were distributed to undergraduate students at UBC through social media apps like Facebook and Instagram. The survey takes on a quantitative analysis approach consisting mainly of quantitative questions and a couple of qualitative questions. The questions were answered based on a student's behaviour prior to the COVID-19 pandemic.

Data Analysis

The survey mainly consisted of quantitative questions but had a couple of qualitative questions that focused on suggestions for how to improve the current walking programs and another open ended question that asked participants to elaborate on their thoughts of how they viewed walking as a health related behaviour. The survey was broken down into four parts. The first part consisted of the individual's background information when it comes to physical activity (e.g. how many hours they engage in physical activity in a week vs. how much time they spend being sedentary). The second part consisted of the participant's attitudes and motivations towards walking as a form of health promotion (e.g. barriers for why individuals don't participate in walking vs. reasons for why they do participate). The third section was a walkability assessment

that consisted of three questions measuring undergraduate students' perceptions of three constructs we found reflected overall walkability of the UBC Vancouver campus, as previously mentioned. These three constructs were: (1) perception of enjoyment walking on campus, (2) perception of safety in relation to bike and vehicle traffic, and (3) perception of safety after dark. These constructs were measured using a likert scale ranging from extremely bad (given the numerical value of 1) to extremely good (given the numerical value of 5). We also assessed accessibility. However, we did not use a likert scale, instead we measured the distance of known suitable walking routes in relation to students' main area of study or area they most frequented. The fourth part consisted of the individual's perceptions of the walking programs offered by Move UBC (e.g. have participants heard of the walking programs offered by Move UBC, would they consider participating in one and why or why not, and would participation increase if walking programs could be incorporated into an individual's daily schedule, routine, or transportation to and from school).

Participants

Our target population for this study were undergraduate students at UBC. We chose this target population because increasing physical activity during the college years is important as it is a transitional period that seems to be a time in which activity declines for a significant number of students (Bang et al., 2017). Additionally, this is an important community to draw participants from because there are unique barriers that students face during university years such as lack of time, motivation, equipment, and regular sedentary behaviour contributable to class time and studying (Pachu et al. 2020). University students' intention to exercise tends to have more variability in vigorous exercise behaviour (e.g. sport teams, dancing, swimming, and cycling)

than intention for lifestyle behaviours such as walking (Rebar et al. 2014). We have focused on younger students (18-25) because the transition into post-secondary studies typically seems to increase sedentary behaviours. A significant contributor to sedentary behaviour among university students is the arrangement of class schedules, lack of movement breaks during class, and restrictive classroom infrastructure (i.e. lack of sit-stand desks) (Pachu et al. 2020).

Survey Method/Types of Research Questions

UBC Vancouver offers walking programs on campus such as Wellbeing Walks offered by the MoveCrew, Walk For Joy, which is a 9 week walking challenge that's led by UBC Recreation, and Run/Roll/Walk, which incorporates walking into a 10 week challenge. Surveys are the form of data collection in this study because we want a larger sample size, and this is something that is hard to obtain with an interview method that explores the cases of fewer individuals (Kowalski et al., 2018). Also, we wanted to gauge the general trend in the experiences, opinions, and behaviours of individuals when it comes to walking, which is an aspect that surveys provide as you can make general claims due to a larger sample size (Lowe et al., 2010). Moreover, surveys are more convenient from a time standpoint as they are quick for students to fill out and answer, compared to an interview. As stated by Fowler (2009), surveys offer the ability to gain rapid returns of responses. Furthermore, participants appear to be more comfortable giving sensitive information over the computer compared to an interview (Fowler, 2009). The survey questions focus on establishing barriers as to why an individual's walking rates may be low throughout the day while on campus. It's important to understand the different barriers that students face in regards to the survey questions because some of the barriers are out of an individual's control, whereas other barriers are more controllable. Research questions

pertaining to barriers that are outside of an individual's control include aspects like the campus being built in a way that is conducive to promote walking, if the participant has any health conditions or physical disabilities that makes it difficult for them to walk, and if their work/school schedule is set up in a way that limits their ability to engage in an adequate amount of walking on a daily basis. On the contrary, research questions pertaining to barriers that are within an individual's control include aspects such as the participants thinking that walking is an important activity for reducing sedentary behaviour and achieving positive health outcomes. Other aspects involve whether or not participants take part in walking as a goal directed behaviour, and if they are self conscious when it comes to walking (e.g. keeping track of their daily step count). Control over potential barriers differs, and it's important to know if limited participation in walking on campus or limited engagement in walking programs is due to individual/social desires, or environmental/structural concerns.

RESULTS

Background

The inclusion criteria for this study included undergraduate UBC students. There were a total of 41 participants who completed the survey. The participants' ages ranged from 20 to 25, where 17 of the respondents reported that they were 22. Out of the 41 respondents, 22 identified as male and 19 identified as female. 37 of the participants were full-time students and four were part-time students. One (2%) participant reported that they were in their first-year; three (7%) participants were in their second-year; seven (17%) participants were in their third-year; 26 (63%) participants were in their fourth-year; and four (10%) participants were in their fifth-year.

The most common method of transportation that was used to travel to the UBC Vancouver campus was by bus/skytrain, which was reported by 25 (61%) of the participants. Seven (17%) participants reported that they travelled by car, three (7%) participants travelled by biking, three (7%) participants travelled by walking, and three (7%) participants stated that they have never travelled to campus.

When asked how long it took to travel to the UBC Vancouver campus, five (12%) participants took 0-15 minutes to get to campus, five (12%) participants took 15-30 minutes, six (15%) participants took 30-45 minutes to get to campus, 14 (34%) participants took 45-60 minutes, and six (15%) participants took 60+ minutes to get to campus. There were four (10%) participants that revealed they live/lived on campus and one (2%) participant never travelled to campus.

Attitudes and Motivation Towards Walking

The three main reasons that participants engaged in walking was to simply get out and move, nature and scenery viewing, and transportation to and around school (See Figure 1). When asked if there were any barriers to walking, participants reported that the main barriers were homework load, time conflict, and weather (See Figure 2). Participants were asked an open-ended question about their perceptions of walking as a health-related behaviour. 32 (78%) participants stated that walking provides great health-related benefits. However, nine (22%) participants stated that walking is not an effective health-related behaviour.

Figure 1

What are the reasons that you engage in walking? (Check all that apply)

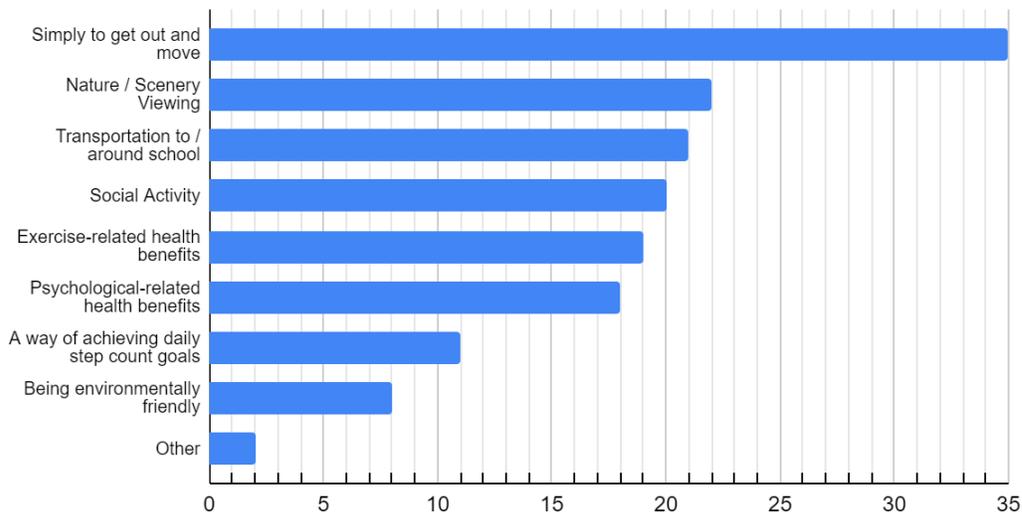
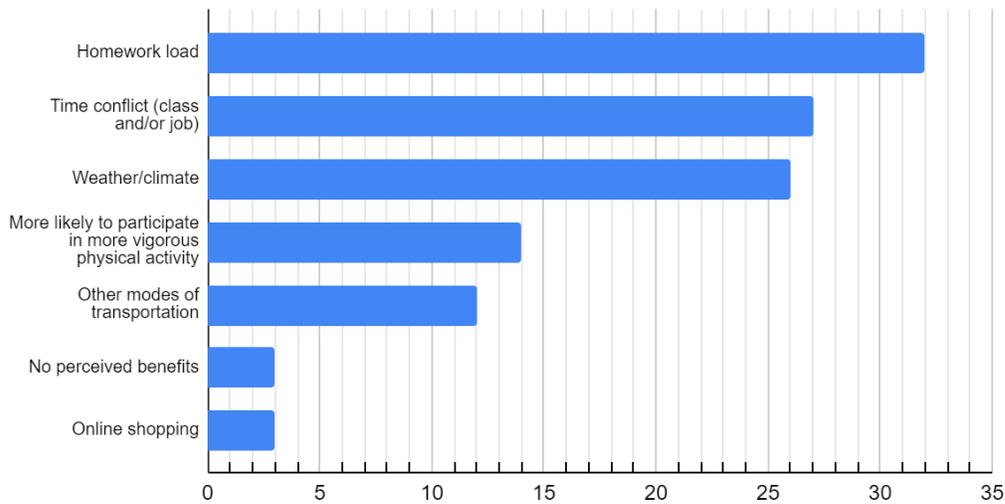


Figure 2

Are there any barriers that may be preventing you from engaging in walking? (Check all that apply)



Walkability of UBC Vancouver Campus

Participants were asked about a specific location or feature on the UBC Vancouver campus that discouraged their walking. Of the 41 responses, 23 participants revealed locations

and features that discouraged their walking. The most common feature that discouraged walking in the participants was areas with poor lighting. Moreover, in relation to the COVID-19 pandemic, one participant shared their concerns about people not wearing masks, where they stated, “If more people visiting the beach wore a mask.” When asked about what improvements can be made on campus, 13 of 41 participants suggest that the lighting on campus can be improved.

The next set of questions were asked on a Likert scale. Participants were asked to rate the UBC Vancouver campus as an area to engage in walking activities. 19 (46%) participants said the campus is extremely good, 17 (42%) said somewhat good, and five (12%) said neither good nor bad. When asked how they would rate their safety using the sidewalks/crosswalks on campus in relation to vehicle and bike traffic, 11 (27%) participants said extremely good, 25 (70%) said somewhat good, four (10%) said neither good nor bad, and one (2%) said somewhat bad. In how they rated their safety walking the trails/roads of UBC Vancouver after dark, 3 (7%) participants said extremely good, 13 (32%) said somewhat good, 16 (39%) said neither good nor bad, 8 (20%) said somewhat bad, and one (2%) said extremely bad.

Perception of Move UBC’s Walking Programs

Out of 41 participants, 31 (76%) never heard of Move UBC’s walking programs, and 10 (24%) heard of at least one of UBC’s walking programs. The most well known walking program was Wellbeing Walk (See Figure 3). When asked if participating in a walking program would provide a meaningful exercise experience, 28 (68%) participants answered yes, and 13 (32%) answered no. However, 27 (66%) reported they would not consider participating in any of the walking programs that UBC Recreation offers. The three main reasons that participants would

not consider a walking program were that they preferred walking alone or with friends, preferred participating in moderate to higher intensity activities, and that they had no interest (See Figure 4). When asked, “If you were to participate in a UBC Rec walking program, what might be some of the motivations/reasons?”, the main reasons were social interaction, health benefits, relieving stress, and enjoying nature (See Figure 5).

Participants were asked if they would be more inclined to participate in a walking program that was incorporated into their daily class schedule and transportation to and from school. Of the 41 participants, 36 (88%) answered yes, and 5 (12%) answered no.

Figure 3

Have you heard of MoveUBC's various walking programs? If yes, which one? (Check all that apply)

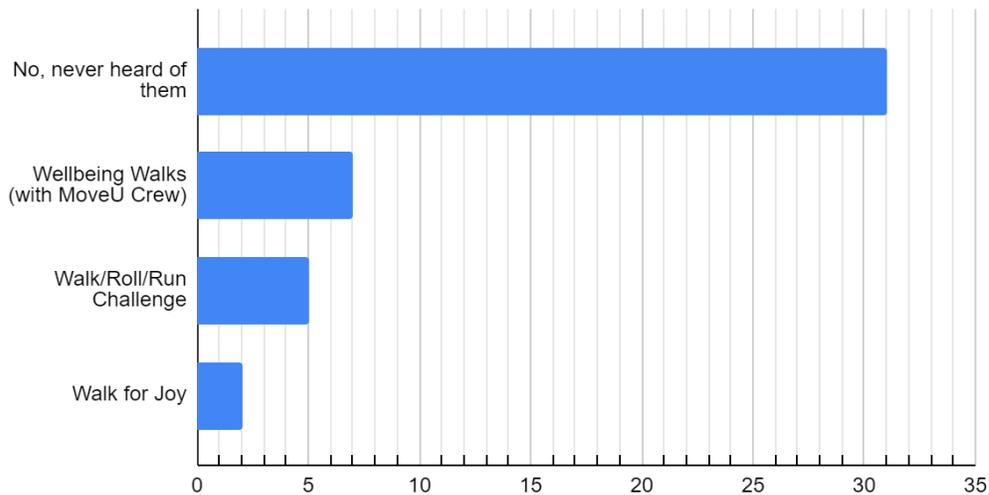


Figure 4

If you would NOT consider participating in any of the walking programs that UBC Rec offers, why not? (Check all that apply)

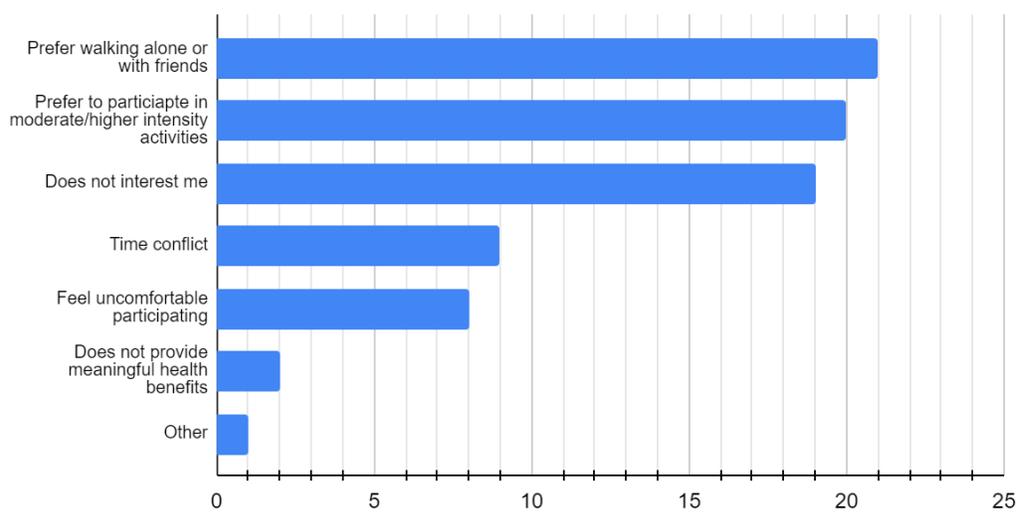
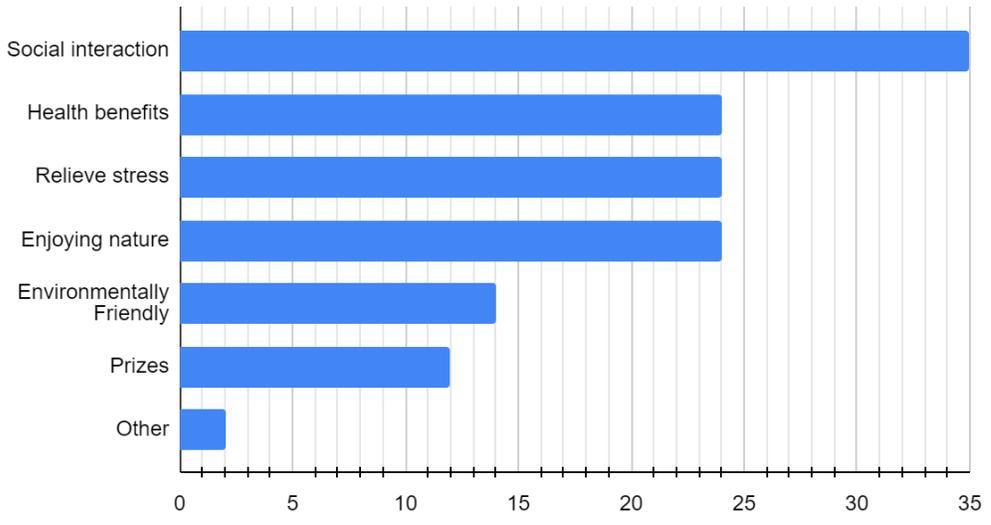


Figure 5

If you were to participate in a UBC Rec walking program, what might be some of the motivations/reasons? (Check all that apply)



DISCUSSION

One of the most significant findings that emerged from our survey results was the issue of lighting on the UBC Vancouver campus. Two areas of our survey showed results that we deem

to be noteworthy and both indicated that lighting on campus was an area of concern. The first result emerged from the walkability assessment portion of our survey that rated participants' perception of several features relating to the overall walkability of the UBC Vancouver campus. Our literature review highlighted the importance of walkability on college campuses and provided associated determinants that we used to measure undergraduates' perception of UBC Vancouver's overall walkability. Our findings reflected one determinant in particular that the walkability literature noted as a common barrier to walking activity on college campuses, students' perception of safety after dark. Our survey asked students to rate their perception of their own safety walking the trails and roads of UBC Vancouver after dark. This was the poorest scored area of the walkability assessment with a mean score of 3.2/5, and a mode of 3/5, with 16 of the 41 participants responding 'neither good nor bad', 8 participants scoring 'somewhat bad', and 1 scoring 'extremely bad'.

The other finding that indicated lighting to be an area of concern was echoed in the open-ended question on our survey that asked participants for any suggestions about improvements that could be made to a location on campus that discourage their walking. Our findings showed that 'more lighting' was the overwhelming theme as 13 out of the 41 participants suggested that improvements be made to the lighting on campus. 18 participants did not provide a specific location or feature, thus, 57% of participants that answered, indicated lighting as an area of concern. This finding, coupled with the lowest score on the walkability assessment being 'perception of safety after dark', indicated that lighting on campus to be an area of improvement.

Another significant finding came from the open ended question that asked participants what their perceptions were regarding walking as a health related/promoting behaviour. There

were 9 responses that conveyed walking to not be an effective method of health promotion. Most of these participants stated that they don't see walking as an activity that produces the desired level of physical health benefits, and they would rather engage in higher intense forms of physical activity like running or strength training. One participant stated that to them, walking could only produce real physical health benefits if the physical activity session is done for a long period of time, which indicates that other forms of physical activity are more prioritized because they are more time efficient in bringing the desired physical health benefits. A question that built off of this was when the survey asked participants if they would ever consider participating in any of the walking programs that UBC Recreation offers (presented to the participants in the survey), and if the answer was no, then what was the reason as to why these participants would not consider participating. 27 out of the 41 participants (66%) answered that they would not consider participating in a UBC Recreation offered walking program, and 19 participants (46%) answered that they would not participate due to a lack of interest in engaging in such programs. These results show that intrinsic motivation for participants is lacking as they don't see themselves as having enough of a drive or interest to participate, mainly because they don't see enough of a justification from an improved physical fitness standpoint (49% chose this as a barrier).

Another finding we found interesting was that 36 out of the 41 participants (88%) answered that they would consider participating in a UBC Recreation walking program if the program was incorporated into their daily class schedule or routine. Moreover, related to this finding, 88% of participants also answered yes to the question that asked them if the UBC Vancouver campus is an area that you enjoy walking in, which shows that there are aspects of walking that participants view favourably, but barriers such as time conflict are present in many

cases. Also, 66% of the participants had no prior knowledge that UBC Recreation offered walking programs. One participant was interested in participating but did not hear about such a program being offered at the University as they said “I wasn’t aware this program existed, I wonder if this could be more widely advertised as it sounds great.” Another participant stated that “I think Move UBC having a walking initiative is good too because from my experience, I only know them coming to classes and conducting movement activities so this is more to know”, which again highlights the need for more effective advertising to reach more of the undergrad population as the barrier or a lack of knowledge towards the offered programs is evident.

One response that stood out to us emerged from the question that sought suggestions on improvements that could be made to improve a feature of location on campus that discourages walking. One participant’s concern of the lack of mask wearing at the beach located at the UBC Vancouver campus elucidated the potential impact that the COVID-19 pandemic may have on walking behaviour and walkability on campus. As students begin returning to campus, COVID-19 related restrictions and/or apprehensions and uneasiness regarding the virus may influence students’ participation in a walking program where social interaction is one of the main reasons for participation at 85%. Overall walkability, and in particular safety, may also be influenced by mask wearing behaviour on campus as well. Furthermore, 61% of students used the bus/skytrain as their main mode of transportation to the UBC Vancouver campus prior to the pandemic. As this is a mode of active transportation and significant facilitator to non-leisure walking on and off campus (Mundorf et al. 2018), we foresee this behaviour as potentially influencing active transportation once students begin returning to campus.

Challenges/Limitations

One of the challenges of our study was finding out how to differentiate between leisure and non-leisure forms of walking not only on campus, but in general. Leisure forms of walking (e.g. nature walks) are much easier for participants to accurately self-report data in a quantitative manner because they're more likely to keep track of it (e.g. in the form of exercise logs), since it is a form of non-incident physical activity. Non-leisure forms of walking can provide a challenge for accurately obtaining quantitative data from participants because it is a form of incidental physical activity that most people accumulate without paying much attention to as they get from point A to point B. For example, it is difficult for individuals to accurately report the number of minutes they walked in the grocery store buying items or how many minutes they accumulated walking on campus throughout the day. The one type of non-leisure form of walking that we were able to include was the length of transportation to and from school, and if this transportation method included walking. We dealt with this challenge by incorporating some non-leisure forms of walking (e.g. transportation, if they engage in online shopping) into questions that for example asked why individuals engage or do not engage in walking as a way of collecting data for non-leisure forms.

One of the limitations of our study is we did not go in depth in regards to the different features and opportunities of the walking programs that are offered by UBC Recreation; in other words, we didn't differentiate between the goals and characteristics of Wellbeing Walks, Walk for Joy, and the programs that offer walking challenges for students to complete. Differentiating between the different programs could have given us a deeper insight into how the motivations and attitudes of students work, and if the competitive or goal fulfilling aspect of walking challenges could facilitate more participation from the undergrad community at UBC. Some

students may prefer certain walking programs offered by UBC Recreation more so than others, and it's important to analyze this as a means of improving programs in the future.

RECOMMENDATIONS

The first recommendation is geared towards the walkability of the UBC Vancouver campus. Our findings showed that lighting was an area of concern, that we deemed to be important based on the survey results. We suggest that more lighting be implemented to poorly lit parking areas, sidestreets, and shortcuts as these are areas that participants noted often lack good visibility after dark. One participant also suggested that solar powered lights could be added to walkways or where cars are parked as an added safety measure.

The second recommendation to improve the currently existing walking programs is to use a class based incentive system to encourage more participation in the program through extrinsic motivation to minimize the barriers of a lack of self interest or not viewing walking as an intense enough activity to participate in the currently existing programs. For example, UBC Recreation can pair with members of the KIN faculty in which KIN professors offer a participation grade in their grading scheme for classes if you participate in such a program over the course of a semester.

The third recommendation to improve the currently existing program is to specialize walking programs for different faculties, and not just have walking programs that are mainly associated with the Kinesiology department. If programs were integrated into class schedules for specific departments, then more students might be able to participate with their friends and not have time conflict preventing them from participating, since these specific programs will work around the class schedules of students in different faculties. This is offered as a recommendation

because as previously mentioned, 36 out of the 41 participants stated that they would participate if walking programs were incorporated into their daily schedules or routines. Also, time conflict (66% of participants) is a big barrier to walking, while walking as a means of social activity is a big facilitator (49% of participants); this recommendation minimizes the barrier of time conflict and supports the social activity aspect of walking.

The last recommendation is for future research in how the COVID-19 pandemic will influence students' walking behaviour once they return to campus. Because of the impacts of COVID-19 on one's health, students may be more reluctant to participate in a walking program that offers a means of social interaction and health benefits. The study should address questions such as when people return to campus, how likely they are going to feel comfortable participating in walking groups, walking indoors, and other implications such as mask-wearing. As mentioned, 61% of students used the bus/skytrain as their main mode of transportation before the pandemic, which could be classified as a part of active transportation. However, due to the pandemic, students who often took the bus/skytrain before the pandemic may use other options to get to school, such as by car. Pertaining to the question regarding what locations individuals avoid walking around and why, one participant stated that they are not comfortable walking around campus in the present state, only if "more people visiting the beach wore masks". Therefore, we believe it to be possible that certain individuals may not be comfortable walking in particular areas or participating in group based activities such as a group walking program when they return to campus. We would also suggest that challenge based initiatives may be better suited for 'return to campus' as people may still be hesitant to participate in group activities even after restrictions are lifted.

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Appendix A: Online Survey Questions

What is your age?

Are you a full-time or part-time student?

Full-time

Part-time

1st Year

2nd Year

3rd Year

4th Year

Other:

What is your gender?

Male

Female

Non-binary / third gender / queer

Two-spirit

Other

Prefer not to say

How long does it take to travel to UBC-V campus (pre- or during covid)?

0 - 15 mins

15 - 30 mins

30 - 45 mins

45 - 60 mins

60+ mins

I live/lived on campus

I have never travelled to campus

What is the main method of transportation you use to travel to UBC-V campus (pre- or during covid)?

Walking

Biking

Car

Bus/Skytrain

I have never travelled to campus

Other (Please specify):

Do you suffer from any disabilities, health conditions, or impairments that may affect your physical activity participation?

- Yes
- No
- Prefer not to say

How many hours in a week do you engage in physical activity?

- <1 hour
- 1 - 2 hours
- 2 - 3 hours
- 3 - 4 hours
- 4 - 5 hours
- >6 hours

How many hours in a day do you engage in sedentary behaviour (any waking behaviour involving sitting and laying)?

- <4 hours
- 4 - 5 hours
- 5 - 6 hours
- 6 - 7 hours
- 7 - 8 hours
- 8 - 9 hours
- 9 - 10 hours
- >10 hours

How many hours in a week do you spend walking as a leisure activity?

- <1 hour
- 1 - 2 hours
- 2 - 3 hours
- 3 - 4 hours
- 4 - 5 hours
- >6 hours

What are the reasons that you engage in walking? (Check all that apply)

- A way of achieving daily step count goals
- Simply to get out and move (breaks between tasks or prolonged sitting)
- Nature / scenery viewing
- Transportation to / around school
- Social activity
- Being environmentally friendly
- Exercise-related health benefits
- Psychological health benefits
- Other (Please specify):

Are there any barriers that may be preventing you from engaging in walking? (Check all that apply)

- Homework load
- Time conflict (class and/or job)
- No perceived benefits
- Other modes of transportation (eg. driving, biking, etc.)
- Online shopping
- More likely to participate in more vigorous physical activity
- Weather/climate
- Other (Please specify/describe):

What are your perceptions of walking as a health-related behaviour?

Which main building/area on campus do you spend the most time at (pre- or during covid)

Is there a walking route within walking distance of your main building(s) that you are aware of? If so, how far?

- <5 minutes
- 5 - 10 minutes
- 10 - 15 minutes
- 15 - 30 minutes
- >30 minutes
- I am not aware of any walking routes

Is there a specific route/location/feature on the UBC-V campus that you frequently walk/encourages your walking?
(eg. forested trails, sidewalks on both sides of the street)

Is there a specific route/location/feature on the UBC-V campus that you avoid walking/discourages your walking?
(eg. poorly lit sidewalks, traffic)

For the location that you avoid walking/discourages your walking, what improvements can be made to this location
to make it more appropriate/safer for walking?

Are you familiar with the term walkability (desirability, accessibility, and safety of walking routes within a specific
setting)?

- Yes
 No

Is the UBC-V campus an area that you enjoy walking? If no, what might be some of the reasons?

- Yes
 No

How would you rate UBC-V campus as an area to engage in walking activities?

- Extremely good
 Somewhat good
 Neither good nor bad
 Somewhat bad
 Extremely bad

How would you rate your safety using the sidewalks/crosswalks on campus in relation to vehicle and bike traffic?

- Extremely good
 Somewhat good
 Neither good nor bad
 Somewhat bad
 Extremely bad

How would you rate your safety walking the trails/roads of UBC-V after dark?

- Extremely good
- Somewhat good
- Neither good nor bad
- Somewhat bad
- Extremely bad

Have you heard of MoveUBC's various walking programs? If yes, which one? (Check all that apply)

- Walk for Joy
- Wellbeing Walks (with MoveU Crew)
- Walk/Roll/Run Challenge
- No, never heard of them

If yes, how did you hear about them? (Check all that apply)

- Friends
- Newsletters
- Social Media
- Posters
- Website
- Never head of them
- Other (Please specify):

Do you think that participating in a walking program would provide a meaningful exercise experience?

- Yes
- No

Would you ever consider participating in any of the walking programs that UBC Rec offers?

- Yes
- No

If you would **NOT** consider participating in any of the walking programs that UBC Rec offers, why not? (Check all that apply)

- Does not provide meaningful health benefits
- Prefer walking alone or with friends
- Prefer to participate in moderate/higher intensity activities
- Time conflict
- Feel uncomfortable participating
- Does not interest me
- Other (Please specify):

If you were to participate in a UBC Rec walking program, what might be some of the motivations/reasons? (Check all that apply)

- Social interaction
- Health benefits
- Relieve stress
- Environmentally friendly
- Enjoying nature
- Prizes
- Other (Please specify):

If a walking program was incorporated into your daily class schedule/routine or transportation to and from school/class, would you be more inclined to participate?

- Yes
- No

Do you have any other comments or feedback pertaining to your involvement in walking and the overall walkability at UBC-V?

Appendix B: Consent Form

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

Participant Consent Form

Walking Programs - How Can We Better Promote Them? Group 11

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 evaluating the existing walking programs that are being offered by UBC Recreation and provide recommendations that could improve the programs to promote more walking on campus.

Study Procedures:

With your permission, we are asking you to participate in a survey regarding your interest/experiences with the walking programs that are being offered by UBC Recreation. 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 survey 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 you consent to participate in this study?

- Yes, I consent to participate in this study
- No, I do not consent to participate in this study

Appendix C: Recruitment



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

If you are a full-time undergraduate student interested/have experience with the walking programs offered at UBC, we would like to speak with you!

As part of a course-based research project (KIN 464), we are conducting a study on how to promote more walking on campus. If you are a **full-time undergraduate student**, we would love for you to complete a survey.

More information <https://kin.educ.ubc.ca/research/research-subject-recruitment/> or email dtong98@student.ubc.ca.

Participants who fit the criteria and complete the survey will be eligible to enter a draw for 3 prizes (2 x \$25 UBC Bookstore gift card or UBC Food Services gift card and 1 Fitbit)

Link to the survey: https://ubc.ca1.qualtrics.com/jfe/form/SV_0kqOjcJIsSfTmC2

Please note that this post is public and anyone who likes, comments or shares the link will, by doing so, be associated with the study. The Principal Investigator on this project is Dr. Andrea Bundon (andrea.bundon@ubc.ca).