

UBC Social Ecological Economic Development Studies (SEEDS) Sustainability Program

Student Research Report

UBC Indian Female Undergraduate Students: Cultural, Gender, and Student-related Barriers to Physical Activity

Eshah Qureshi , Charles Meng, Amadis Wong, George Gao, Ishan Dixit

University of British Columbia

KIN 464

Themes: Community, Health, Wellbeing

Date: Apr 2, 2020

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/report 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 project/report".



UBC Indian Female Undergraduate Students: Cultural, Gender, and Student-related Barriers to Physical Activity

Eshah Qureshi

Charles Meng

Amadis Wong

George Gao

Ishan Dixit

University of British Columbia

Dr. Andrea Bundon

April 2, 2020

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/report 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 project/report”.

Executive Summary

In partnership with the Social Ecological Economic Developments Studies (SEEDS) at the University of British Columbia (UBC), *UBC Indian Female Undergraduate Students: Cultural, Gender, and Student-related Barriers to Physical Activity* aims to identify barriers to physical activity (PA) for female Indian undergraduate students. Our study utilized a survey to evaluate our population's concerns, attitudes, usage, demographic, and understanding regarding PA. The survey was conducted for four weeks and was held in various locations around the UBC campus such as the UBC Nest, Irving K. Barber Library, and Buchanan Building. The survey was also accessible online. The data was collected from 44 participants.

Through the use of thematic analysis and descriptive statistics, we identified barriers affecting the PA rates and perceptions of our demographic. We found that western culture had a profound impact on the participants' perceptions of PA which included feelings of excitement and importance towards PA. Furthermore, structural barriers such as lack of time and large school workloads were observed to reduce PA access. Other barriers such as cultural barriers and gender-related barriers further diminished engagement in PA behaviour via lack of familial support.

Recommendations to increase PA in our target demographics were made in regard to mental health, incentives, and program changes. Specifically, we suggested that the promotion of PA for psychological and physiological health benefits be performed more aggressively, in addition to the creation of incentives that make PA more affordable for students at UBC. Further research should look into a longitudinal design that takes into account a sedentary lifestyle.

Introduction

Health, as defined by the World Health Organization (WHO), refers to “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (WHO, 2020a). Among these predictors of health, PA tends to decline the most abruptly as young adults transition to university, negatively impacting overall wellbeing and overall lifetime PA habits (Huang et al., 2003). PA, as stated by Caspersen, Powell, & Christenson, is the systematic, structured, and repetitive movement of the body with the intention of improving or maintaining physical fitness (1985). Moderate-vigorous intensity physical activity (MVPA) is defined as activity that causes an effort-induced increase of heart rate (WHO, 2020b). Engagement in PA is known to improve the quality of life, elevate health outcomes, and can significantly impact primary and secondary prevention of chronic disease and premature death (Penedo & Dahn, 2005; Warburton, Nicol, & Bredin, 2006). As PA is recognized to have numerous health benefits (Penedo & Dahn, 2005), this rapid decline in young adults has serious implications for their future health and thus should be addressed.

Despite its numerous benefits, accessibility to PA is unequal, presenting a boundary that bars many young adults from adequate participation (Wilson, Kirtland, Ainsworth, & Addy,

2004). The barriers to PA that are routinely encountered by university students are multifactorial in nature and intersect with different aspects of life that impact different communities in their own way. One such community that has been shown to under-engage in PA opportunities are young female Indian university students — generally between the ages of 18 to 25 (Rao, 2010). In this study, the term Indian refers to those who identify as hailing from the Republic of India. At UBC, little is done to address the many socio-cultural and accessibility barriers that affect female Indian undergraduate students, and as such they are at greater risk of inactivity, having significant implications for their future physical activity habits (Huang et al., 2003).

Through an opportunity offered by the Social Ecological Economic Development Studies (SEEDS) at the University of British Columbia (UBC), we worked with UBC Recreation on the ‘Recreation Opportunities for Target Demographics’ research project to address this issue. In coordination with the KIN 464 teaching assistant Jackie Lee, our UBC Recreation partner Alyssa Reyes, and Dr. Andrea Bundon, we aimed to identify the barriers to PA participation in female Indian undergraduate students at UBC; and make recommendations that will guide future UBC Recreation initiatives to address this issue.

Literature Review

Gender Roles in Physical Activity

In general, women in society participate less in PA than men (The Lancet Public Health, 2019). This trend impacts many different forms of PA such as sports participation and engagement in leisure activities (Allender, Cowburn, & Foster, 2006; Deem, 1982). Consequently, the physical fitness of women is lower than men posing health concerns as women attain a lower level of fitness on average (Stodden, Langendorfer, & Roberton, 2009). Factors that contribute to the decreased participation in PA by females include their motivations to participate and negative stereotypes that may stop them from doing so (Hermann & Vollmeyer, 2016). In an investigation by researchers Kilpatrick, Hebert, and Bartholmew, it was found that one of the largest disparities between male and female PA motivations was weight management, being a top priority among women but not men (2005). They went on to hypothesize that the difference was due to the women’s self-perceptions of weight and beauty and the social pressures to which they were exposed (2005). Other evidence supports these findings, with cultural stereotypes of fragility and femininity limiting female participation in PA (Vertinsky, 1995). These gender-specific barriers are major factors that impede usage and access of PA opportunities for women (Vertinsky, 1995). Conversely, contemporary increases in women-only gyms and women-only hours have increased accessibility and confidence of females to participate in PA (Ostgaard, 2006).

Cultural Barriers

Roa (2019) found cultural constraints related to PA participation rates, in thousands of Indian college-women chosen through random sampling yielded. Specifically, the barriers outlined by the study were: 1) Lack of encouragement from family, 2) Ability to deviate from

traditional female roles in sport, 3) Deficient sports orientation in society, 4) Under-informed leadership in PA, 5) Nonexistent sport frameworks/PA motivation systems, and 6) being contingent on whether they attended public, government-funded colleges as opposed to private universities. Escaping the orthodox position prescribed to women in general as well as the expectations of women in India proves to be difficult; coupled with a severe need for structural upheaval in sports, Indian college women face cultural barriers to integrating PA into their lives.

In North America, visible minorities are less likely to participate in organized sports and thus PA in general (Marquez, Neighbors, & Bustamante, 2010). Marquez et al. (2010) in combination with the concerns outlined by Rao (2010), manifests in an arguably cumulative effect further exacerbating the limited opportunities due to cultural constraints for the sample population to partake in PA. India and the west are a vast distance apart — geographically and culturally — but their shared sociodemographic retain some traditional mindsets. Consequences of this far-stretching relationship can exist as social exclusion which contributes to cultural gaps due in part to miscommunications (Kanungo, 2013).

There are several complexities along with sociocultural contexts that affect the attitude towards an active lifestyle. If behavioural changes that improve health are to be achieved, it is important for researchers to understand how individuals perceive PA (Henderson & Ainsworth, 2003). It appears that there are a wide variety of sociocultural constraints that are preventing Indian women from being physically active. Constraints are defined as anything that limits a person's participation in activities. These constraints include a range of perceptions such as finding time and energy along with parental, traditional, financial, and personal barriers (Henderson & Ainsworth, 2003; Eime et al., 2013).

Males are typically deemed as more aggressive and competitive compared to females who are perceived to engage in fun-based activities (Ramanathan & Crocker, 2009). Participants in Ramanathan & Crocker (2009) study believed that the motivation for PA for males is their muscles whereas Indian women are physically active to lose weight and to look attractive. There is a lack of support from parents and family members when it comes to the participation of females in sports compared to males (Eime et al., 2013; Rao, 2010). The difference arises from the society defined role of a woman along with the traditional way of living where women are to focus on tasks such as cooking and taking care of the household (Ramanathan & Crocker, 2009). It was suggested by another participant that girls are trained to eventually take care of the household which compromises their time along with the opportunity for engaging in PA (Ramanathan & Crocker, 2009). These traditional views create greater barriers for their women as they are pressured to conform to the cultural norms which leads to less participation in sports and PA in general (Rao, 2010).

Student Related Barriers

Prior inquiries to PA health in college have been conducted before. Huang et al. (2003) found PA decreased when students transitioned from high school to university resulting in negative health outcomes. This is further corroborated by Nelson, Gortmaker, Subramanian, & Wechsler's (2007) research where they found there was higher participation in PA during high

school in comparison to college. The decrease can happen due to many factors; Naha, Goldfine, & Collins (2003) stated perceived barriers as the prevalent explanations for diminished PA in young adults. From these perceived factors, two categories were most relevant: situational and physical barriers. Situational is defined as transient changes in one's life that affects PA (Naha, Goldfine, & Collins, 2003). For example, these could include workload, schoolwork, or bad weather.

Physical barriers are related to constructs that inhibit health behaviour (Naha, Goldfine, & Collins, 2003). These include incompetent coaches, lack of programs, lack of facilities, lack of transportation, or policies. Across many studies, the most popular reason was lack of time (Dishman & Sallis, 1994). However, Dishman & Sallis (1994) also counter lack of time's popularity as a choice due to it being an easy answer.

An intriguing point was made by Dishman and Sallis (1994) where they found college women thought PA was too expensive, hard without a partner, was too boring, and unsupported by their families. In a prior KIN 464 SEEDS research paper, barriers mentioned for female students were lack of knowledge and cost issues (Tinkham et al., 2019). Their study went on to critique UBC Recreation's *Move More, Learn More* program and provided recommendations. To increase participation, the program was recommended to advertise to reach a broader audience on campus as well as provide attractive modes of PA delivery (Tinkham et al., 2019). By doing so, the program would be more accessible and reduce barriers for international students (Tinkham et al. 2019). We further build on this suggestion specifically for our demographic later in our study.

Justification of Study Design and Purpose

A wide variety of constraints have been identified in the literature pertaining to the PA habits of young Indian women (Marquez, Neighbors, & Bustamante, 2010; Henderson & Ainsworth, 2003; Eime et al., 2013). Using this information, the present study focuses on female Indian undergraduate university students between the ages of 18 to 25. A significant barrier to PA that has been identified in previous research regarding this demographic is the role that cultural norms play in ostracizing women from fitness institutions (Ramanathan & Crocker, 2009). Despite the evidence that the PA participation rates of young Indian women fall below those of western culture (Eime et al., 2013; Rao, 2010), the structural barriers such as transportation, accessibility, socioeconomic status, and time (especially restricted for this particular age group) are not well researched. Based upon this knowledge gap, we focused on identifying the relevant structural barriers that reduce our target demographic's PA engagement and investigated the cultural interactions of these barriers. This data is to be used to make informed recommendations to UBC Recreation to better engage this population in PA programming. As such, the purpose of this study was to effectively identify the barriers that prohibit female Indian undergraduates at UBC from partaking in PA. The information garnered from this inquiry will be shared with UBC recreation to develop a strategic framework to make

PA more accessible and participation-centered to young Indian women and those with whom they share cultural similarities.

Methods

Ethical Considerations

The study was conducted following the *Tri-council Policy Statement* requirement in Canada. All group members who conducted the survey had completed the *Tri-Council Policy Statement (TCPS) 2 Tutorial* prior to commencing the research (Appendix A). Participants' free, informed and ongoing consent was ensured throughout the research study. The method of using a survey was chosen as it is an effective approach to explore the patterns and features of a specific demographic (Goertz & Mahoney, 2012). In alignment with the purpose of our study, the survey investigated the potential gaps that prevent members of our target demographic from engaging in PA. To identify these barriers, *Qualtrics* software provided by UBC was used to administer the self-reported surveys (Appendix A). *Qualtrics* was used to confirm that data collection was aligned with UBC's Freedom of Information and Protection of Privacy Act (FIPPA) (University of British Columbia, 2020b) which ensured that the data collected was stored within Canada to ensure participant privacy. Prior to commencing the survey, participants were presented with the informed consent form detailing the study's purpose, inclusion criteria, outcomes, confidentiality, potential risks, and contact information. Contact information was provided in the event that participants wished to request further information on the study or to file ethics complaints. Additionally, it was made clear that participants could withdraw consent at any point during the survey participation process.

Survey Format

After informed consent was addressed at the start of the survey, MVPA was clearly defined to reduce response error and language barriers. The survey (Appendix A) consisted of multiple-choice questions including "select all options that apply" questions, Likert-type questions and two open-ended questions. The multiple-choice questions and Likert-type questions resulted in quantitative data whereas the two open-ended questions were qualitative in nature. As such, our data collection was a mixed method process which integrated quantitative and qualitative techniques. Moreover, our initial multiple-choice questions served to eliminate those who did not meet our inclusion criteria. The questions that followed addressed the characteristics of our target demographic more directly. Likert-type scale questions were then used to provide insight into the attitudes and characteristics of the population group. The available options on the 7-point Likert scale ranged from "strongly disagree" to "strongly agree" in order to optimize response reliability and accuracy (Preston & Colman, 2000). These scales will assist with the comparison of results in the event that the study is replicated (Colman, Norris, & Preston, 1997). Many multiple-choice questions were used to identify the barriers to PA, better enabling us to understand the participant opinion and behaviour (Allen, & Seaman,

2007). Where appropriate, an “other” option was available, however, participants would have to specify their reason for choosing ‘other’ in order to justify their selection. Finally, two open-ended questions were presented at the end of the survey so that participants could share more without feeling restricted by the predetermined choices. The open-ended questions were included to circumvent our own biases as we received responses that were not addressed by the multiple-choice questions. The first of the open questions allowed participants to raise concerns or share suggestions regarding cultural considerations and its relation to participation in PA. The second question allowed participants to write about ways that UBC Recreation can make PA more accessible and attractive for them. Overall, all of our questions were designed to be short, clear and concise to reduce language barriers as the survey was only made available in English.

Survey Questions

First, two Likert-type scale questions targeted the financial aspect of PA engagement — how health could be a monetary investment and if individuals were willing to spend themselves into it. The next few questions aimed to engage participants in self-reflection in order to evaluate what could potentially be driving or dissuading them from pursuing PA. The survey then sought to understand the pursuit of PA as a lifestyle, with questions aimed at assessing physical barriers such as academic commitments, family support, and cultural bias. In evaluating the external and internal factors surrounding the participants, we were able to probe for the potential gaps and which helped us identify the barriers to PA on campus for our targeted population. The questionnaire also provided valuable feedback about the participant’s level of satisfaction with the current PA opportunities present on campus as well as potential areas of improvement. The intention for our study was to gather knowledge on how we could make PA more accessible.

Study Population & Sampling Frame/ Recruitment

The target population of our survey was female Indian students at UBC between the ages of 18 to 25. This type of sampling is known as purposive sampling; we identified and engaged in a selective group of people as they represent information-rich cases for the objective of interest. In this instance, the group shared characteristics such as ethnicity and gender. Additionally, due to there being a limited number of data sources in the population, purposive sampling allowed for a speedy and time-efficient data collection from our target demographic.

The main incentive for students to participate was the provision of an opportunity for the students to voice their opinions and provide recommendations on issues surrounding their PA barriers on the UBC campus. It was expected that this emphasis would be a good motivating factor as participants would be aware that they could benefit from the programs developed from their recommendations. However, to further increase interest, the option to take part in a draw for a \$30 gift card at the UBC Bookstore was also made available. This was done via linking a separate Qualtrics survey for draw contact information to continue ensuring anonymity (end of Appendix A).

Data Collection & Analyzation Techniques

The survey was a cost effective and reliable method of inquiry since they were standardized such that the questions were phrased the same way for each participant. This allowed for the data to be collected in a structured, quantitative manner that was easy to draw results and graphs from for general inferences. As for the qualitative two open-ended questions at the bottom, we analyzed those using thematic analysis to help us identify trends within the demographic.

Our original intended method of data collection was physical on-campus interactions in which we would ask passing students that met our inclusion criteria to participate in our study. However, an expected challenge emerged with the outbreak of the COVID-19 pandemic leading the Public Health Agency of Canada along with the Government of British Columbia to ratify social isolation and general avoidance of other people (University of British Columbia, 2020a). The effect of this on our data collection process was that we solely transitioned to online methods of communications – sending the surveys directly to people and by posting them on Facebook groups, including, but not limited to: UBC Class of 2020, UBC Class of 2021, UBC Kin Class of 2020, UBC Indian Student Association "Utsav". Other than responses received from our posts, we also actively reached out to potential participants via Facebook direct messaging to see if they would be willing to contribute to the survey.

The survey was open for 4 weeks with a target of 30-40 responses as suggested by the project's Principle Investigator, Dr. Bundon. Ultimately, our goal was exceeded (n=44), which further aided us in identifying the potential barriers as stated prior. The sample size was imperative to demonstrating the impact of the results. After completing the data collection, analysis consisted of quantifying survey responses through descriptive statistics by looking at measures of central tendency. When analyzing qualitative characteristics of our data, the process included a thematic analysis used to look for general themes and trends within our demographic. These themes were consistent with the previous works of literature thereby allowing for the connection between the literature review to our findings in the discussion section.

Challenges

Selection bias was the main challenge for data collection due to our choice of purposive sampling. The subjectivity and non-probability-based nature of purposive sampling presented difficulty for us to defend the representativeness of the sample. Compared with probability sampling techniques that are designed to reduce such biases, whereas purposive sampling makes it difficult to convince the reader that the judgement we used to select participants was appropriate (Sharma, 2017). Due to this, it may pose an issue for us to describe our results as achieving a theoretical, analytic or logical generalization.

Response bias posed another possible challenge. When generating a response, participants consider multiple sources of information: question phrasing, social desirability, or the way the participants were approached (Furnham, 1986; Orne, 1962). We minimized the possibility of response bias by managing acquiescence bias, demand characteristics, extreme responding and social desirability. A balanced number of positively and negatively worded

questions were created, and questions were arranged with no particular order to minimize acquiescence bias. To reduce demand characteristics, all questions were stated objectively and clearly to reduce the chances of the responses being biased because of our expectations on a certain topic. This ensured that we did not create an implicit demand for the sample to perform as expected (Orne, 1962). For extreme responding, we constructed survey questions that were short and clear, and we also aimed to keep the length of the survey within 5-8 minutes to ensure that participants would not lose engagement (Revilla & Ochoa, 2017). Lastly, social desirability was limited by making the survey anonymous and responses concealed from the interviewer.

As mentioned earlier under ‘Data Collection’, a challenge that arose during our data collection process was the COVID-19 pandemic. With government sanctions enforcing social isolation and quarantine, our original intention to personally approach and interact with students on campus was no longer feasible. However, even before the government mandated sanctions, it was difficult for us to attract students in person as people were not inclined to get near us due to the fear of potentially contracting the coronavirus. This issue made it difficult for us to acquire sufficient responses in the weeks before UBC’s transition to online learning. To mitigate the effects of this, we only used online platforms to acquire responses from then on. However, overall online platforms were thought to be less effective than in-person interactions since we could engage potential participants to our study. As mentioned previously we posted our survey in various Facebook groups, however because social media is a weaker channel of communication than face-to-face interactions it was difficult to engage students to take the time to do our survey.

Results/ Findings

Participant Demographics

Forty-four participants completed the survey on PA when it was open. Our sample was composed of the female Indian population of ages 18 to 25 at UBC (Appendix C, Figure 1; Appendix C, Figure 2; Appendix C, Figure 3). The participants ranged from ages 18-23, in years 1-5 of their undergraduate program (Appendix C, Figure 3; Appendix C, Figure 4). The mean age was 20.32. Of the 44 respondents, 16% were in first year, 18% in second year, 18% in third year, 32% in fourth year and 16% in fifth year (Appendix C, Figure 4). The mean year of study was 3.14 (Appendix C, Figure 4). When asked about sexual orientation 82% of the participants identified as heterosexual, and 18% identified within the categories of queer, unsure, bisexual/pansexual, prefer not to answer and asexual (Appendix C, Figure 5). The respondents were evenly split in terms of birth, with 50% born in Canada and 50% born elsewhere (Appendix C, Figure 6). Only 2 responders had been in Canada for less than one year while 6 had been living in Canada between one to two years (Appendix C, Figure 7). There were 2 participants that lived in Canada for between two and five years, 4 for between five and ten years, 4 for between ten and fifteen years, 7 for between fifteen to twenty years, and 7 for over twenty years

(Appendix C, Figure 7). In our sample, 27% of participants drove to school, 27% took public transit campus, and 46% lived at UBC (Appendix C, Figure 19).

Physical Activity Motivations

When designing the survey, one of our goals was to examine the participation in recreational physical activities of female Indian undergraduates at UBC. In this survey a Likert scale was used to examine the relationships that these students had with PA. In the results, we categorized responses in groups: Agree, Strongly Agree and Somewhat Agree as Agreed, Neither Agree nor Disagree as Neutral, and Disagree, Strongly Disagree and Somewhat Disagree as Disagreed (Appendix C, Figure 8).

We examined the relationship these students had with PA and came to find that 91% of respondents enjoy PA and 98% of participants generally agree that PA benefits health (Appendix C, Figure 8). Next, respondents discussed the influence of Indian role models that encourage engagement in PA (Appendix C, Figure 8). 27% fell within the agreeable category believing there were sufficient Indian role models, 23% were neutral, and 50% disagreed (Appendix C, Figure 8). Of the participants that believed weight was directly related to health, 55% agreed, 11% were neutral and 32% disagreed (Appendix C, Figure 8). In addition, 95% of respondents disagreed with the statement that people who are overweight do not need to participate in PA and 5% agreed with the statement (Appendix C, Figure 8). Next, 66% agreed that PA is considered important in their family whereas 11% were neutral and 23% disagreed (Appendix C, Figure 8). In terms of excitement before participating in MVPA, 55% agreed, 2% were neutral, and 14% disagreed (Appendix C, Figure 8). Additionally, 100% agreed that there is beneficence to financially invest in their physical health (Appendix C, Figure 8). However, only 52% of participants believed their PA is adequate with 14% feeling neutral, and 34% believing their PA to be inadequate (Appendix C, Figure 8).

Factors listed as motivators (with participants having the ability to choose multiple options) that would encourage respondents to do PA were health with 41 responses, body image with 41 responses, mental acuity with 45 responses, confidence with 40 responses. There was 1 choice for 'Other' with the reasoning reported as elevation of performance (Appendix C, Figure 15).

Barriers to Engagement in MVPA

Inquiring on conditions that can facilitate MVPA, the most prevalent factor reported was an affordable gym membership at 36 responses (Appendix C, Figure 9). At n=23, the next cited facilitating factor was having a gym partner (Appendix C, Figure 9). Reduced schoolwork and an increase in culturally relevant programs came next at 15 and 14 responses respectively (Appendix C, Figure 9). The least reported elements were a greater diversity of PA programs offered at UBC at 8 and having an increased presence of women in PA facilities with 7 (Appendix C, Figure 8). In the category of Other, there were 3 votes which were: 1) subsidized

gym memberships off-campus, 2) if they lived closer to campus, and 3) if campus gyms were less busy (Appendix C, Figure 8).

When asked about the barriers preventing participation in MVPA, the reasons selected were “low energy levels” being a primary factor with 32 responses (Appendix C, Figure 17). Next was “not motivated” with 26 responses, “lack of confidence in ability to be physically active” with 15 responses, “too much time commuting” at 12 responses, and “financial barriers” with 8 responses (Appendix C, Figure 17). Moreover, other non-mentioned reasons were ticked with 7 responses with reasoning including 1) Lack of support from family and friends at 4 responses, 2) Lack of access to transportations with 3 responses, and 4) cultural considerations with 1 response (Appendix C, Figure 17).

Resources Available to Participants

When designing this study, a goal was to determine the resources that affected the sample’s ability to participate in PA. Regarding temporal constraints, 59% of respondents disagreed they had enough time to participate in MVPA while 5% reported neutral and 36% agreed (Appendix C, Figure 8). In the study, 66% of students believe that schoolwork plays a large role in restraining their participant levels in physical activities (Appendix C, Figure 9). When comparing minutes of PA performed per week, 32% of the sample met the MVPA standards of 150 minutes per week during break/vacation contrary to 18% while in school (Appendix C, Figure 11; Appendix C, Figure 12). In terms of affordability, 91% of the respondents agreed they could afford to engage in PA while 9% disagreed (Appendix C, Figure 8); Contrary to this, n=36 listed gym membership affordability as a factor discouraging them from PA (Appendix C, Figure 9). Programs at UBC such as *Move More, Learn More* were considered as student resources and when questioned on their knowledge on the existence of the stated program, 71% answered ‘No’ (Appendix C, Figure 13). Next, they were asked if they’ve seen UBC Recreation advertisements around campus and 84% responded ‘Yes’ (Appendix C, Figure 13).

Discussion

Influence of Western Culture

As indicated in the results, we found that 50% of our sample was born in Canada (n=22) with the other half being born elsewhere. One of the reasons for seeking out this information was because ideas around PA differ in Western culture as compared to other cultures (Caperchione, Kolt & Mummery, 2009). With this information we were interested in seeing if the participants’ place of birth had an effect on perceptions around PA and their PA levels. Additionally, for those who were born elsewhere (n=32), we were also interested in finding out how long they have lived in Canada for the same reason. The options that were picked the most were 1+ year (18.75%, n=6), 15+ years (21.88%, n=7), and 20+ year (21.88, n=7) (Appendix C, Question 7).

From the distribution of results for these two questions, we can conclude that participants in our sample size were affected differently from western perceptions regarding PA. The longer participants lived in Canada, the more integrated they are to be in western culture including their PA engagement (Caperchione, Kolt & Mummery, 2009).

Although in our findings, we discovered that length of time spent living in a western society has an effect on PA levels and perception, few studies have directly examined the association between length of time and its effect on PA. For recent immigrants, cultural changes associated with health and PA may be a worthy area for future research. Additionally, future studies would benefit from longitudinal designs that access the prevalence of lifestyle inactivity factors that are associated with barriers specific to certain demographics and incidence of risk factors such as chronic disease (Caperchione, Kolt & Mummery, 2009).

Perceptions

To achieve behavioural changes regarding health, researchers must understand how individuals perceive PA (Henderson & Ainsworth, 2003) as mentioned previously. To gain an understanding of our target demographic's perceptions around PA, we had 19 questions focused on the attitudes, importance and excitement towards PA. We found that while most of the participants enjoy PA, only about 50% of them felt excited prior to MVPA. We can attribute these findings to the responses of other questions that were constraints focused. We found that many students lack the energy, motivation, and confidence in their ability to be physically active. These constraints to PA contribute to the development of their perceptions regarding the subject.

When examining financial constraints in our target demographic it was found that these constraints specifically had little to none effect on our demographic. From our sample of Indian undergraduate women at UBC, a considerable percentage (91% Agree) affirmed that they can afford access to PA and every participant believed (100% Agree) it was beneficial to their overall wellbeing (Appendix C, Figure 8). A factor that perhaps contributes to this finding is the \$35 membership per semester that is offered by UBC recreation (UBC Recreation 2020a). Conversely, participants still feel that gym membership affordability is a factor that discourages PA engagement (Appendix C, Figure 9) thereby suggesting that accessibility needs to be further enhanced.

Structural Constraints

Our findings connect with and build upon previous literature by identifying these previously mentioned gaps specifically for the target demographic. A noteworthy trend was inferred from the comparison of MVPA undertaken by participants between school semesters and out-of-school months (e.g. breaks and vacations). A greater number of participants engaged in MVPA for more minutes when they were outside school implying that a major barrier to PA is due to school-related responsibilities.

Similarly, many respondents (66%) cited schoolwork as an impediment to their involvement in PA, and if they had less schoolwork, they would partake more in PA. Even

though all participants believed PA benefits health and engagement in MVPA is advantageous, only 52% of our sample agreed their current PA commitment is adequate for their needs. This indicates a large capacity to which PA can be improved. One of the areas of improvement that we found through the analysis of our collected data was that shockingly, only 29.5% of our sample had heard of, seen advertisements of, or were knowledgeable of the Move More, Learn More initiative on the UBC Campus (further discussed in the “Recommendations” section). We discuss more techniques that UBC Recreation could implement to increase awareness about this program in the ‘Recommendations’ section.

An average student’s time is quite thinly distributed over a multitude of activities. This is confirmed by our gathered data, since many participants stated that one of the barriers preventing their engagement in MVPA is that they spend too much time commuting. This response can be inferred as not having enough time for PA. Furthermore, exactly 50% of our sample size either commuted to campus through car or public transportation; the other lived in residences across campus. As such, it is imperative for our target population that there must not be a temporal barrier that hinders participation in PA.

Cultural Constraints

A common theme that surfaced was the influence of family on PA perceptions and level. Several individuals mentioned cultural views that suggested being “skinny” as being equal to healthy thus there seemed to be no need to participate in PA from the views of their family. To enhance the understanding of this issue, we will now quote a few responses that identified such topics. A quote from one participant out of several who fell under this theme is “I have a naturally lean figure and high metabolism...Indian women of older generations often tell me to not work out because I am already fit and skinny”. Another participant said that “everyone in my family thinks that skinny is healthy but they also want me to eat more so they can look more womanly”. These views connect with cultural constraints identified by previous literature regarding body image (Kilpatrick, Hebert, & Bartholomew, 2005; Ramanathan & Crocker, 2009). Along the lines of cultural views around body image another participant said:

“Taking culture into consideration, one of the Reasons I am motivated to exercise is to avoid body-shaming. As a female raised in a traditional Indian household, I believe attitudes towards weight and body shape are negative and demeaning. The pressure to maintain an ideal body, as well as wanting to avoid judgement and criticism over body size motivates me to be active” (Appendix B, Question 20).

As mentioned, there were repetitive themes surrounding the idea of body image and PA. This relates to previous works of literature that identified body image as one of the reasons why some females engage in PA and some do not (Kilpatrick et al., 2005; Ramanathan & Crocker, 2009). In our findings, cultural ideas surrounding this topic dismissed those who were “skinny” from participating in PA while others participated in PA solely because of body image. One participant mentioned that they are “more motivated towards summer because there’s usually a wedding or similar event coming up” thereby supporting attitudes towards body image as the

sole motivator for PA. Our findings connect with and build upon previous literature by identifying constraints for the demographic.

We plan on addressing these issues through more education regarding the physiological and psychological benefits of PA for all. By doing so, we hope to change the perceptions around PA in regard to it as an optional activity for those wanting to change their body image and instead as a requirement for a healthy lifestyle. Further details on our suggestions can be found in the recommendations section.

Gender Barriers

Responses from our open-ended question regarding cultural consideration that would make participants more likely to engage in PA were mostly focused towards female only gym hours (Appendix B, Question 20). Moreover, one participant mentioned that many women in their culture prefer to engage in PA with only other females around. They went on to specify that it is not because of parental preferences rather an issue of comfort. Another participant said that before immigrating to Canada, they only participated in PA around other women. Although UBC recreation does have female only hours, we have suggested some changes in the 'Recommendations' section below.

Family views regarding PA also revolved around the idea of PA being more for males, with one participating describing their experience with this as: "boys are considered the athletes in [the] house" (Appendix B, Question 20). Several participants also mentioned that they grew up without an emphasis on PA from their parents; to further enhance the understanding of this issue we will now discuss quotes from participant responses. One participant said that "Physical activity is not a major part of my culture" with another saying that "my family does not believe in physical activity". All of these responses emerge from the lack of support received by participants from their family members. Our findings connect to previous literature as the difference between males and females arises from the society defined role of a woman along with the traditional way of living where women are to focus on tasks such as cooking and taking care of the household (Ramanathan & Crocker, 2009). Moreover, previous literature also highlights the fact that girls are trained to eventually take care of the household which compromises their time along with the opportunity for engaging in PA (Ramanathan & Crocker, 2009).

The results reveal that 61% of our participants on an average week in school engaged in less than 90 minutes of PA per week with only 52% of our sample agreeing that their current PA commitment is adequate for their needs (Appendix C, Figure 11; Appendix C, Figure 12). These traditional views create gender related constraints for females as they are pressured to conform to the cultural norms thereby contributing to the low hours of PA participation per week as mentioned earlier (Rao, 2010; Eime et al., 2013). To address this issue, it would be beneficial to increase PA resources for females to decrease the effect of lack of support from their families. This could include more female gym hours and female PA groups where females will have the

support of other females contributing to an increase in their sense of connection and motivation to PA.

Recommendations

When providing recommendations, we considered the fact that perceptions of PA differ between cultures as previously discussed (Caperchione, Kolt & Mummery, 2009). An important consideration to PA promotion and increasing accessibility to PA is the educational component. It is especially important to pay close attention to the information pertaining to physiological and psychological benefits of PA (Caperchione, Kolt & Mummery, 2009). The educational component needs to address changes in lifestyle behaviour such as decreasing sedentary activities and diet that result from cultural roots thus decreasing the long-term effect these behaviours have on chronic disease (Caperchione, Kolt & Mummery, 2009).

Mental Benefits of PA

College and university students are at high risk for developing mental health issues and conditions that may affect their ability to think and feel (Giamos et al., 2017). Severe mental health issues may even affect students' ability to perform daily functions and interact with other members of the community (Giamos et al., 2017). When students fail to meet expectations, they have set out for themselves in their academic environment, disappointment, anxiety and depression may follow (Corrigan, Markowitz, Watson, Rowan, & Kubiak, 2003; Eisenberg, Downs, Golberstein, & Zivin, 2009; Mowbray et al., 2006). However, PA has been recognized as a key factor in the prevention and management of mental illnesses (Teychenne et al., 2020). Many participants stated academic commitments as a considerable barrier thus PA participation should be promoted as a manner of restoration. Instead of presenting PA as an extraneous narcissistic pursuit for body image and threshold health, existing PA programs on campus could be promoted as tools for mental healing and wellbeing. Furthermore, studies show that the pathophysiology of depression can be attributed to a lack of dopamine, where low vigour present as a symptom (Ebert et al., 1996). Nevertheless, regular engagement in PA has been correlated with an increase in dopamine levels (Köhncke et al., 2018). From the survey responses, lack of energy was identified as a major perceived barrier, and UBC could initiate a campaign where energy level improvements could be highlighted as the main drive.

Incentives

High levels of enjoyment and preference for PA have been identified as factors related to establishing healthy PA habits (Miyawaki et al., 2014). Moreover, the presence of a partner to exercise with has also been identified as an important factor in PA as it helps make the environment safe, fun and creates more accountability (Miyawaki et al., 2014). From survey responses, two important potential driving factors for participation were "if gym memberships were more affordable" and "if I had a partner", which prompts the recommendation for UBC

Recreations to create “2 for 1” incentives. This would help encourage PA participation by making it more affordable whilst also addressing the partner situation. Many of the responses for the open-ended questions on our survey stated that working out with a partner would greatly increase their likelihood for engagement.

Program Changes

Changing the promotion of programs to specifically target Indian women as well as starting similar initiatives on campus could lead to an increase in PA of Indian female undergraduate students. Furthermore, promotional material should be shared through various mediums that haven’t been used for delivery before. Online sharing of UBC Recreation promotions that are more vibrant and distinct would lead to more awareness around the Move More, Learn More program (and by extension, other programs similar to it); the same outcome could be achieved through printed posters around the places that are considered ‘high traffic’ to increase the awareness around initiatives hosted by UBC Recreation.

Thus far, UBC Recreation has been hosting free programs during the first two weeks of the semester (UBC Recreation, 2020b), we believe that this is an excellent strategy for students to engage with the many opportunities and discover what they prefer to be their mode of PA. Furthermore, the addition of MoveUBC during the month of February is a very-welcome opportunity to engage in PA for many students, especially during that time interval as midterm exams are occurring. Both of these initiatives should continue and if possible, executed more often. For example, the MoveUBC initiative would be successful in the months of October or November, as midterm exams for the fall semester occur throughout those two months.

An opportunity that we believe UBC Recreation can capitalize on would be the addition of female-only hours to a variety of programs. Our collected data, specifically the open-ended questions at the end of our survey, showed that many users of the UBC Recreation facilities would prefer female only spaces/timings (Appendix B, Question 21). Provision of these facilities would lead to great progress in increasing PA for all demographics, as well as combat the gender-related barrier to PA. We suggest that these hours/spaces should be implemented more into the current programs. Furthermore, these hours/spaces should be promoted more as participants might be unaware of them.

Move More, Learn More

Move More, Learn More is a program offered by UBC Recreations that educates the importance of PA and health, and provides the knowledge, skills, and confidence for one to get active and improve their physical and mental wellbeing (UBC Recreation, 2020b). Although this program is open to all self-identified women, there is a specific focus on catering to the Asian women student population for they are a group on average with low levels of PA (UBC Recreation, 2020b). As of now, the program offers activities that are broad with no cultural specificity. Other than yoga, the other movement activities listed have no ties to the Indian cultural heritage. This could be addressed by introducing more culturally specific activities such

as bhangra and cricket. Furthermore, the digital marketing of the Move More, Learn More program could be improved by advertising more culturally specific imaging in order to emphasize the program's focus on the Asian women student population.

PA Promotion Approach

When promoting participation in PA it is important to approach PA promotion from a *strengths-based approach* suggesting that small changes can contribute to big impacts. The strength-based approach considers the growth and safety of the community as a whole. It also considers the innate strengths and aspirations unique to the community (Bundon, 2020). When PA is promoted using the strengths-based approach, we avert from using *threshold-based messaging* in the promotion of PA thereby emphasizing that even in small doses PA can help students live, work and learn their best. More specially, threshold-based messaging implies that the benefits of PA are unattainable if one does not achieve the minimum of 150 minutes of MVPA (Bundon, 2020). Such inaccuracies regarding the benefits of PA further hinder and discourage engagement in PA for inactive students (Lai, 2020).

Concluding Remarks

Due to the emergence of COVID-19, results of our sample size were affected. We were able to exceed our goal sample size, but an even larger population would have allowed for less error and more reliability in our results. For future research in this area, we would be interested in seeing how the change in method of survey delivery would affect sample size and findings. Furthermore, future studies would also benefit from longitudinal designs that would assess the prevalence of lifestyle inactivity contributors that could be associated with barriers and incidence of risk factors specific to certain demographics.

Despite our research study being focused on Indian women undergraduate students of UBC, several of the accessibility recommendations could be applied to many other cultural demographic student bodies. The transferability of the inferred information could help increase overall PA levels for more people on campus. Furthermore, the introduced recommendations were participant-centered, strength-based approaches that address the perception of PA. In order to overcome the existing barriers, we must figure out ways to properly integrate PA into people's lives and help initiate a lifelong path of PA.

References

- Allen, E. A., & Seaman, C. A. (2007). Likert Scales and Data Analyses. *Quality Progress*.
- Allender, S., Cowburn, G., & Foster, C. (2006). Understanding participation in sport and physical activity among children and adults: A review of qualitative studies. *Health Education Research, 21*(6), 826-835. doi:10.1093/her/cyl063
- Boone Jr., H. N., & Boone, D. A. (2012). Analyzing Likert Data. *Journal of Extension*.
<https://www.joe.org/joe/2012april/tt2.php>
- Bundon, A. (2020). *Kin 464: Health Promotion and Physical Activity, lecture 5, February 4* [Course Presentation]. Retrieved from
https://canvas.ubc.ca/courses/37440/pages/lecture-7-managing-sport-brands?module_item_id=1426595
- Caperchione, C. M., Kolt, G. S., & Mummery, W. K. (2009). Physical Activity in Culturally and Linguistically Diverse Migrant Groups to Western Society. *Sports Medicine, 39*(3), 167–177. doi: 10.2165/00007256-200939030-00001
- Caspersen, C. J., Powell, K. E., & Christenson, G. M. (1985). Physical activity, exercise, and physical fitness: Definitions and distinctions for health-related research. *Public Health Reports*.
- Colman, A. M., Norris, C. E., & Preston, C. C. (1997). Comparing Rating Scales of Different Lengths: Equivalence of Scores from 5-Point and 7-Point Scales. *Psychological Reports, 80*(2), 355–362. doi: 10.2466/pr0.1997.80.2.355
- Corrigan, P., Markowitz, F. E., Watson, A., Rowan, D., & Kubiak, M. A. (2003). An attribution model of public discrimination towards persons with mental illness. *Journal of Health and Social Behavior, 44*(2), 162–179.

- Deem, R. (1982). Women, Leisure and Inequality. *Leisure Studies*, 1(1), 29-46.
doi:10.1080/02614368200390031
- Dishman, R. K., & Sallis, J. F. (1994). Determinants and interventions for physical activity and exercise. In C. Bouchard, R. J. Shephard, & T. Stephens (Eds.), *Physical activity, fitness, and health: International proceedings and consensus statement* (p. 214–238). Human Kinetics Publishers.
- Eisenberg, D., Downs, M. F., Golberstein, E., & Zivin, K. (2009). Stigma and help seeking for mental health among college students. *Medical Care Research and Review*, 66(5), 522-541. <https://doi.org/10.1177/1077558709335173>
- Furnham, A. (1986). Response bias, social desirability and dissimulation. *Personality and Individual Differences*, 7(3), 385–400.
- Giamos, D., Lee, A. Y., Suleiman, A., Stuart, H., & Chen, S. (2017). Understanding campus culture and student coping strategies for mental health issues in five Canadian colleges and universities. *Articles*, 47(3), 136-151. <https://doi.org/10.7202/1043242ar>
- Goertz, G., & Mahoney, J. (2012). A Tale of Two Cultures. doi:
10.23943/princeton/9780691149707.001.0001
- Huang, T. T., Harris, K. J., Lee, R. E., Nazir, N., Born, W., & Kaur, H. (2003). Assessing Overweight, Obesity, Diet, and Physical Activity in College Students. *Journal of American College Health*, 52(2), 83-86. doi:10.1080/07448480309595728
- Hermann, J. M., & Vollmeyer, R. (2016). “ Girls should cook, rather than kick! ” – Female soccer players under stereotype threat. *Psychology of Sport and Exercise*, 26, 94-101.
doi:10.1016/j.psychsport.2016.06.010

- Kilpatrick, M., Hebert, E., & Bartholomew, J. (2005). College Students' Motivation for Physical Activity: Differentiating Men's and Women's Motives for Sport Participation and Exercise. *Journal of American College Health, 54*(2), 87-94. doi:10.3200/jach.54.2.87-94
- Köhncke, Y., Papenberg, G., Jonasson, L., Karalija, N., Wåhlin, A., Salami, A., Andersson, M., Axelsson, J. E., Nyberg, L., Riklund, K., Bäckman, L., Lindenberger, U., & Lövdén, M. (2018). Self-rated intensity of habitual physical activities is positively associated with dopamine D2/3 receptor availability and cognition. *NeuroImage, 181*, 605-616.
<https://doi.org/10.1016/j.neuroimage.2018.07.036>
- Lai, Henry. (2020). *Kin 464: Health Promotion and Physical Activity, lecture 7, February 11* [Course Presentation]. Retrieved from https://canvas.ubc.ca/courses/37440/pages/lecture-7-managing-sport-brands?module_item_id=1426595
- Miyawaki, C., Mase, T., Ohara, K., Okuno, S., Okita, Y., Kaneda, H., & Nakamura, H. (2014). Relationship between the existence of exercise partners and exercise habits in university students in Japan. *Health, 06*(16), 2129-2134. <https://doi.org/10.4236/health.2014.616247>
- Mowbray, C. T., Megivern, D., Mandiberg, J. M., Strauss, S., Stein, C. H., Collins, K., Kopels, S., . . . Lett, R. (2006). Campus mental health services: Recommendations for change. *American Journal of Orthopsychiatry, 76*(2), 226–237.
- Nahas, M., Goldfine, B., & Collins, M. (2003). Determinants of Physical Activity in Adolescents and Young Adults: The Basis for High School and College Physical Education to Promote Active Lifestyles. *The Physical Educator, 60*(1).
- Nelson, T. F., Gortmaker, S. L., Subramanian, S. V., & Wechsler, H. (2007). Vigorous Physical Activity Among College Students in the United States. *Journal of Physical Activity and Health, 4*(4). doi:10.1123/jpah.4.4.496

- Orne, M. T. (1962). On the social psychology of the psychological experiment: With particular reference to demand characteristics and their implications. *American Psychologist*, *17*(11), 776–783.
- Ostgaard, G. (2006). FOR “WOMEN ONLY”: UNDERSTANDING THE CULTURAL SPACE OF A WOMEN’S GYM THROUGH FEMINIST GEOGRAPHY.
- Penedo, F. J. & Dahn, J. R. (March 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.
- Preston, C. C., & Colman, A. M. (2000). Optimal number of response categories in rating scales: Reliability, validity, discriminating power, and respondent preferences. *Acta Psychologica*, *104*(1), 1-15. [https://doi.org/10.1016/s0001-6918\(99\)00050-5](https://doi.org/10.1016/s0001-6918(99)00050-5)
- Rao, N. S. (2010). Constraints of Indian women participation in games and sports. Retrieved from https://bjsm.bmj.com/content/44/Suppl_1/i62.4
- Revilla, M., & Ochoa, C. (2017). Ideal and maximum length for a web survey. *International Journal of Market Research*, *59*(5). <https://journals-sagepub-com.ezproxy.library.ubc.ca/doi/pdf/10.2501/IJMR-2017-039>
- Stodden, D., Langendorfer, S., & Roberton, M. A. (2009). The Association Between Motor Skill Competence and Physical Fitness in Young Adults. *Research Quarterly for Exercise and Sport*, *80*(2), 223-229. doi:10.1080/02701367.2009.10599556
- Sharma, G. (2017). Pros and cons of different sampling techniques. *International Journal of Applied Research*.
- Sherrow, V. (1996). *Encyclopedia of Women and Sports*. ABC-CLIO, Inc.: California.

- Sullivan, G. M., & Artino, A. R. (2013). Analyzing and Interpreting Data From Likert-Type Scales. *Journal of Graduate Medical Education*, 5(4), 541–542. doi: 10.4300/jgme-5-4-18
- Teychenne, M., White, R. L., Richards, J., Schuch, F. B., Rosenbaum, S., & Bennie, J. A. (2020). Do we need physical activity guidelines for mental health: What does the evidence tell us? *Mental Health and Physical Activity*, 18, 100315. <https://doi.org/10.1016/j.mhpa.2019.100315>
- UBC Recreation. (2020a). *Fitness Membership & Rates*. Retrieved from <https://recreation.ubc.ca/fitness-classes/memberships-rates/>
- UBC Recreation. (2020b). *Move more, learn more*. Retrieved from <https://recreation.ubc.ca/get-moving/move-more-learn-more/>
- University of British Columbia. (2020a). *Coronavirus (COVID-19) and UBC's response*. <https://covid19.ubc.ca/>
- University of British Columbia. (2020b). *FIPPA-freedom of information and protection of Privacy Act*. SCARP | UBC School of Community and Regional Planning. <https://scarp.ubc.ca/fippa-freedom-information-and-protection-privacy-act>
- Vertinsky, P. A. (1995). Stereotypes of Aging Women and Exercise: A Historical Perspective. *Journal of Aging and Physical Activity*, 3(3), 223-237. doi:10.1123/japa.3.3.223
- Warburton, D. E. (2006). Health benefits of physical activity: The evidence. *Canadian Medical Association Journal*, 174(6), 801-809. <https://doi.org/10.1503/cmaj.051351>
- WHO. (2020a). *Frequently asked questions*. Retrieved from <https://www.who.int/about/who-we-are/frequently-asked-questions>.

WHO. (2020b). *What is Moderate-intensity and Vigorous-intensity Physical Activity?* Retrieved from https://www.who.int/dietphysicalactivity/physical_activity_intensity/en/

Wilson, D. K., Kirtland, K. A., Ainsworth, B. E., & Addy, C. L. (2004). Socioeconomic status and perceptions of access and safety for physical activity. *Annals of Behavioral Medicine*. doi:10.1207/s15324796abm2801_4

Woolum, J. (1998). *Outstanding Women Athletes: Who They Are and How They Influenced Sports in America*. (2nd Ed.). The Oryx Press: Phoenix.

Appendices

Appendix A: Qualtrics Survey Form

KIN 464: Health Promotion and Physical Activity
Participant Consent Form for Class-based Projects

Principal Investigator: Dr. Andrea Bundon (Assistant Professor, School of Kinesiology, Faculty of Education)
Barriers to Physical Activity Participation for Female Undergraduate Indian Students Aged 18-25 at UBC

Project Goal: Identify the barriers to moderate-vigorous physical activity within **Female Undergraduate Indian Students Aged 18-25** at UBC to create recommendations to increase participation in moderate-vigorous physical activity.

Study Procedures: Participants will be asked to complete a 3-5 minute survey regarding their participation and perceptions about moderate-vigorous physical activity in their lives. The survey will be completed through Qualtrics.

Project Outcomes: The gathered data will be compiled and analyzed by the research team then used in a written report for SEEDS. The data will only be shared with partners involved with the project. No personal or identifiable information will be shared or included in the final written report. A final report and summary can be found on the SEEDS Library Website.

UBC SEEDS Library:

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

Confidentiality: Confidentiality is a priority of this study therefore participant names will not be collected. The Qualtrics Surveys will be kept on a secure private Canadian server. All data will be surrendered to Principal Investigator Dr. Andrea Bundon and will be locked in her lab. After 1 year, the locked data and consent forms will be destroyed.

Potential Benefits: 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.

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.

What barriers prevent you from engaging in moderate to vigorous intensity physical activity? (check all boxes that apply)

- I do not have enough energy
- I have a previous injury
- Fear of injury
- Lack of confidence in ability to be physically active
- Lack of support from friends and family
- Lack of access to transportation
- Financial barriers
- I don't like how it feels
- Cultural considerations
- I spend too much time commuting
- I do not feel motivated
- Other

If you selected "Other" in the questions above, please specify below

What is your mode of transportation to campus?

- I live on residence
- I take public transit
- I bike
- I drive

Contact for Information Regarding 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.

The survey refers to physical activity at a 'moderate to vigorous intensity'. The definitions for the intensities have been provided below along with examples.

Moderate-intensity Physical Activity requires moderate amount of effort and elevates the heart rate. Examples include brisk walking, dancing and active involvement in games (WHO, 2020).

Vigorous-intensity Physical Activity requires a significant amount of effort causing a substantial increase in heart rate and causes rapid breathing. Examples include running, fast cycling, fast swimming and competitive sports (WHO, 2020).

Do you identify as a female?

- Yes
- If no, please exit out of the survey as you do not meet the criteria. Thank you.

Are you of Indian descent?

- Yes
- If no, please exit out of survey as you do not meet the criteria. Thank you.

How old are you?

- 18
- 19
- 20
- 21
- 22
- 23
- 24
- 25
- 26+

What year are you in?

- 1st Year
- 2nd Year
- 3rd Year
- 4th Year
- 5th Year+

Do you identify as:

- Heterosexual
- Gay/Lesbian
- Bisexual/Pansexual
- Asexual
- Queer
- Unsure
- Other
- Prefer not to answer

I would partake in physical activity more if (check all boxes that apply)

- I had less school work
- If I had a partner
- If more women were around
- Gym membership was more affordable
- There were more physical activity programs offered at UBC
- There were more culturally-relevant exercise programs at UBC
- Other

If you selected "Other" in the questions above, please specify below

On an average week in school, how many minutes do you engage in moderate to vigorous physical activity per week?

- 0 minutes
- 30-60 minutes
- 60-90 minutes
- 90-120 minutes
- 120-150 minutes

On an average week outside of school (e.g. breaks and vacations), how many minutes do you engage in moderate to vigorous physical activity per week?

- 0 minutes
- 30-60 minutes
- 60-90 minutes
- 90-120 minutes
- 120-150 minutes

Have you heard of 'Move More, Learn More'?

- I have
- I have not

Have you seen any promotional material for UBC Recreation?

- I have
- I have not

What would motivate you to do physical activity? (check all boxes that apply)

- Health
- Body Image
- Mental Acuity (increased focus)
- Confidence
- Other

If you selected "Other" in the questions above, please specify below

What are some cultural considerations that make you more or less likely to engage in physical activity?

What is something that UBC Recreation can implement to make physical activity more accessible or more attractive to you?

Thank you for participating in the survey. If you would like to be entered into the draw please copy and paste the following Qualtrics survey link to provide us with your email.

https://ubc.ca1.qualtrics.com/jfe/form/SV_6wXONMqCYfWJhGt

Appendix B: Responses to Open Ended Questions

Question 20:

What are some cultural considerations that make you more or less likely to engage in physical activity?

I have a naturally lean figure and a high metabolism, so I look quite fit even if I haven't been working out for a couple of days. Indian women of older generations often tell me to not work out because I'm already fit and skinny.

Taking culture into consideration, one of the reasons I am motivated to exercise is to avoid body-shaming. As a female raised in a traditional Indian household, I believe attitudes towards weight and body shape are negative and demeaning. The pressure to maintain an ideal body, as well as wanting to avoid judgement and criticism over body size motivates me to be active.

stereotyped behaviour from others

exercising during a time where the gym is dominated by men

How I grew up with my mom and dad not really emphasizing the importance of physical activity for our health

none

i think i'd like more indian female representation in the programs that ubc rec has available

Physical activity is not a major part of my culture.

I don't think culture factors into my decision to engage in physical activity

Religion

gym hours just for women

I feel that many women in my culture prefer to engage in physical activity around other women. Even though I grew up in a family where my parents did not raise me with ideas such as working out only in front of males, I do sometimes still feel hesitant working out in front of everyone.

Boys are more considered the athletes in my house

I'm Muslim and because of the way that I grew up, getting used to the environment of a gym and working out in a space where all genders do was an adjustment for me. I used to only work out/swim with other women/girls before I immigrated to Canada.

My family does not believe in physical activity

I find working out in a hijab difficult and awkward so I don't feel comfortable

I do not have any cultural considerations that affect how I engage in physical activity.

none I have participated in intense physical activity my entire life.

For making me more likely to engage: Non judgmental facilities, having a resource where I could go to for sample workouts with pictures of someone that is also Indian

I am less likely to participate in physical activity if no one looks like me. I would love a space for other people of colour and LGBTQ2S+ people

Nothing in particular

None

More motivated towards summer because there's usually a wedding or similar event coming up; less motivated in winter

Asians in general are skinny so people think we don't need to work out. Everyone in my family thinks skinny is healthy but they also want me to eat more so I can look more womanly.

None

I can't think of any

None

Indian meatheads at the gym who don't stop staring

I participated in bhangra (cultural dance) for nearly 10 years. It was important and brought me closer to my heritage but also made me more likely to engage in physical activity now.

I think that Indian food contains a lot of fat and oil - so exercise is vital.

Parents consider moderate- vigorous activities to be unladylike. Time should be focused on school and family.

parents being immigrants makes them less likely to participate in pa/exercise thus i didn't grow up in a household that valued pa unless we are in our mother country

N/A

Question 21:

What is something that UBC Recreation can implement to make physical activity more accessible or more attractive to you?

More personal trainers would be cool

extend hours of operation for fitness centres on weekends

maybe a center that has weights but in a more private area

Cheaper and offer more free classes here and there

women only hours

Free parking

a bhangra class

More accessible for inclusion of all students

Maybe having a gym that are a little closer to residence

Cheaper fees

cheaper programs

I would like to see more information on how physical activity is related to mental health and even better grades.

Periodic all female gym hours

More women-only programs; increased promotion on the fact that it's okay to start at whatever level you're at

I just need to be motivated to start- maybe more free first trials

women's only hours

Beginner classes tailored to females specifically.

24 hour gym.

More group fitness classes, having more machines in the UBC gyms (such as treadmills in the ARC), collaborating with off campus studios and providing discounts for UBC students or alumni (such as spin classes)

Separate times/classes for women, more affordable classes

More in residence fitness opportunities

All female space

Have more accessible, affordable and diverse recreational programming. I think there are already some really great one available but sometimes they are just not well advertised and I find out about them much too late.

More public knowledge/updates about when a gym is busy or quiet so I know when to go; more open spaces to run through gym routines that don't require equipment/more widespread knowledge about what spaces there are

I don't know what that is

Some form of accountability

More free classes

More classes lead by women

Cheaper classes with more variety (ie. barre, spin, etc.)

Less expensive events

Nothing. I prefer doing physical activity outside of campus

women's only hours, increase hours (like until midnight)

FREE

Off campus gym deals

Appendix C: Graphed Data

The figures here correspond to their relative questions on the Qualtrics Survey.

Figure 1

Participants Identifying as Female

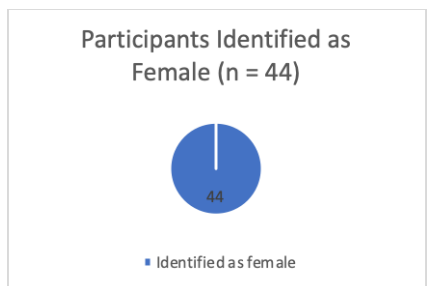


Figure 2

Participants Identifying as Indian

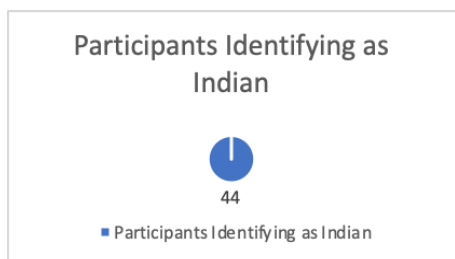
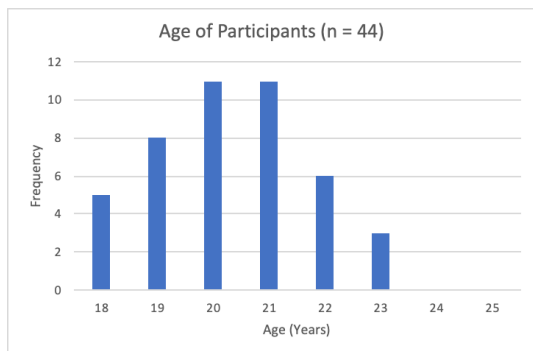


Figure 3

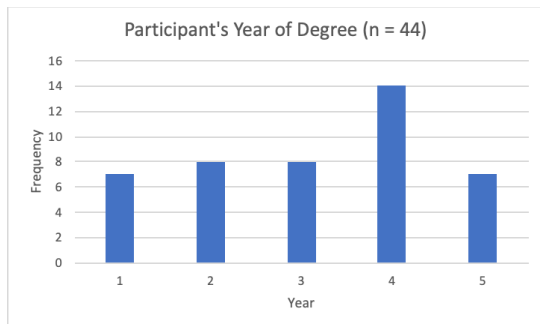
Age of Participants



The mean age was 20.32 years for our sample.

Figure 4

Participant's Year of Study



Mean=3.14, SD=1.31, Variance= 1.75

Figure 5

Sexual Orientation

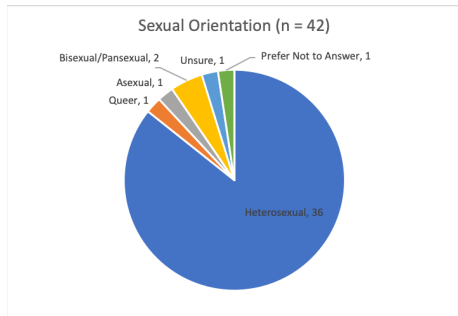


Figure 6

Participants Born in Canada

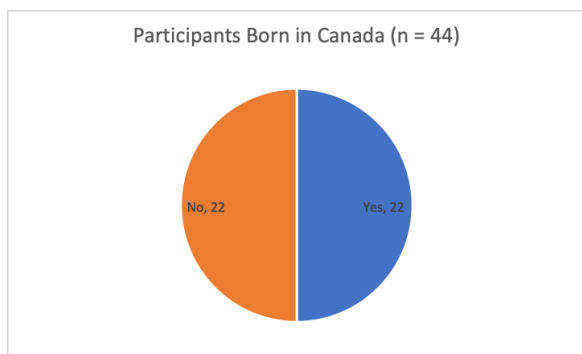
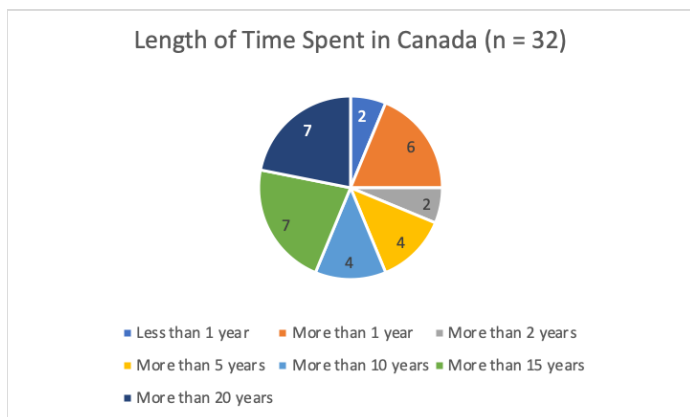


Figure 7

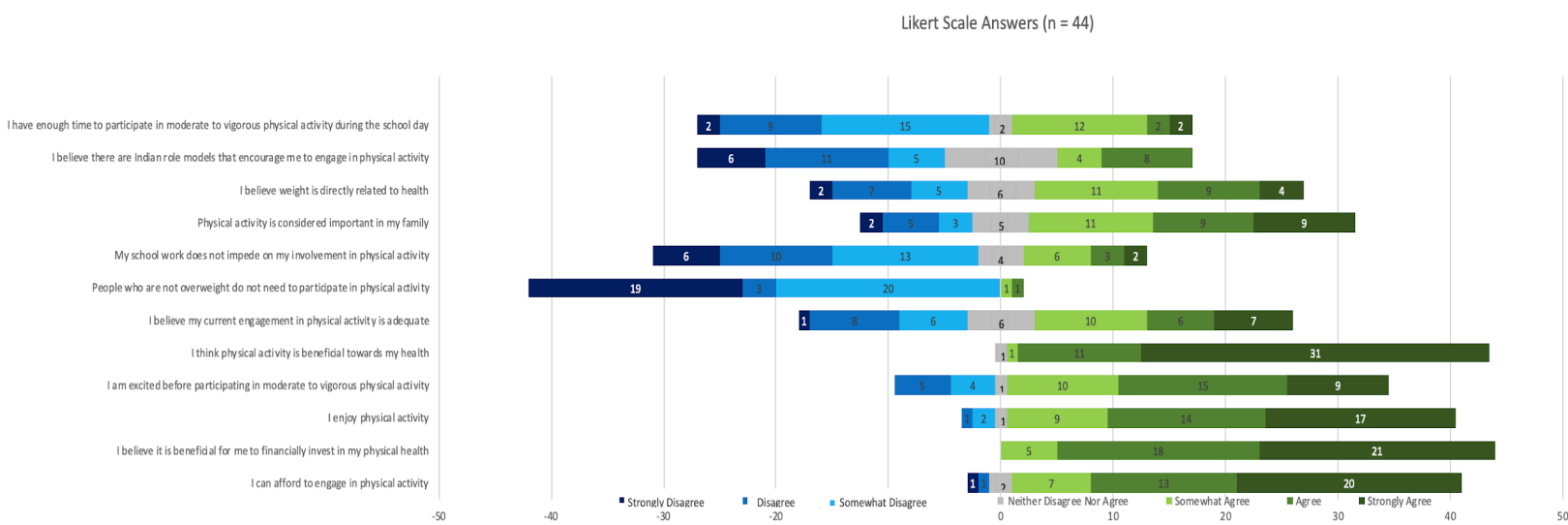
Length of Time Spent in Canada



#	Field	Choice Count
2	< 1 year	6.25% 2
3	1+ year	18.75% 6
4	2+ years	6.25% 2
5	5+ years	12.50% 4
10	10+ years	12.50% 4
11	15+ year	21.88% 7
13	20+ years	21.88% 7
		32

Figure 8

Likert-Type Scale- Rate the degree to which you agree or disagree with the following statements



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	I can afford to engage in physical activity	1.00	7.00	6.02	1.25	1.57	44
2	I believe it is beneficial for me to financially invest in my physical health	5.00	7.00	6.36	0.68	0.46	44
3	I enjoy physical activity	2.00	7.00	5.89	1.27	1.60	44
4	I am excited before participating in moderate to vigorous physical activity	2.00	7.00	5.23	1.55	2.40	44
5	I think physical activity is beneficial towards my health	4.00	7.00	6.64	0.64	0.41	44
6	I believe my current engagement in physical activity is adequate	1.00	7.00	4.45	1.71	2.93	44
7	People who are not overweight do not need to participate in physical activity	1.00	6.00	1.80	1.01	1.03	44
8	My schoolwork does not impede on my involvement in physical activity	1.00	7.00	3.18	1.67	2.79	44
9	Physical activity is considered important in my family	1.00	7.00	4.89	1.71	2.92	44
10	I believe weight is directly related to health	1.00	7.00	4.41	1.66	2.74	44
11	I believe there are Indian role models that encourage me to engage in physical activity	1.00	6.00	3.57	1.60	2.56	44
12	I have enough time to participate in moderate to vigorous physical activity during the school day	1.00	7.00	3.48	1.60	2.57	44

Figure 9

Factors Discouraging PA Engagement

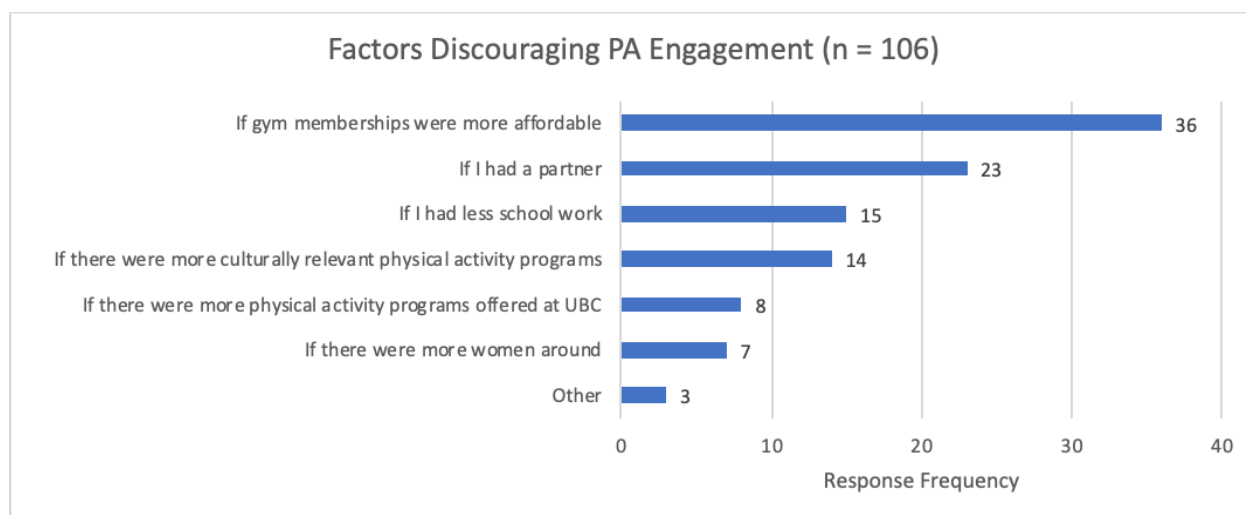


Figure 10

Other Responses

If you selected "Other" in the questions above, please specify below

if i lived closer to campus

If the gyms on campus were not so busy all of the time

Off campus gym deals for people that do not live near ubc

Figure 11 and Figure 12

Average Weekly MVPA of Participants in School vs. Break/Vacation

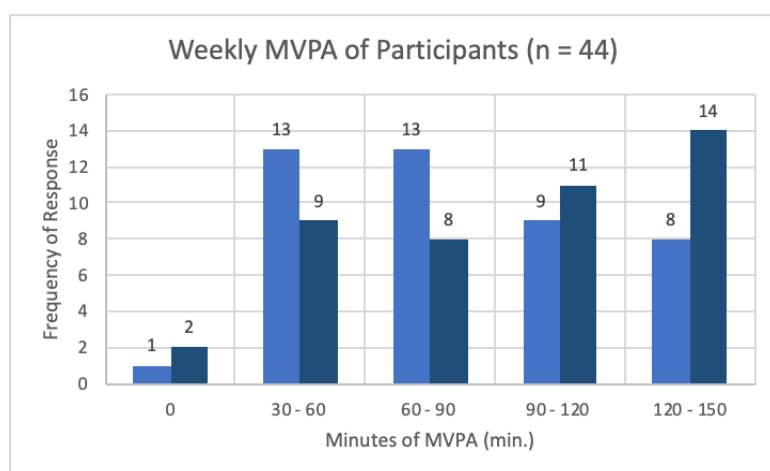


Figure 13

Participants' Awareness of Move More, Learn More

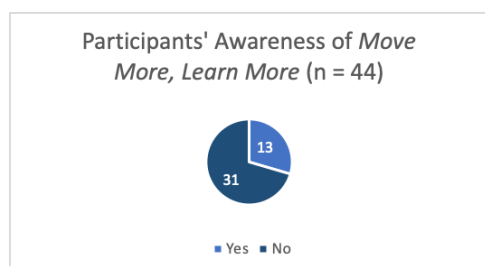


Figure 14

Participants Who have seen UBC Recreation Advertisements

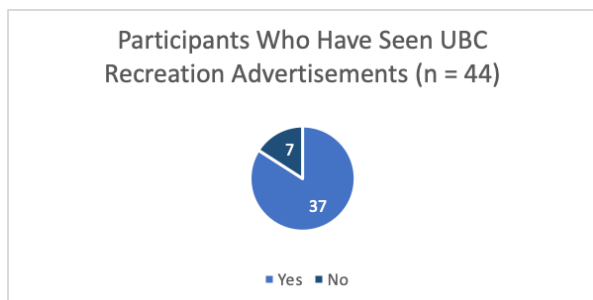


Figure 15

Motivators to Engage in PA

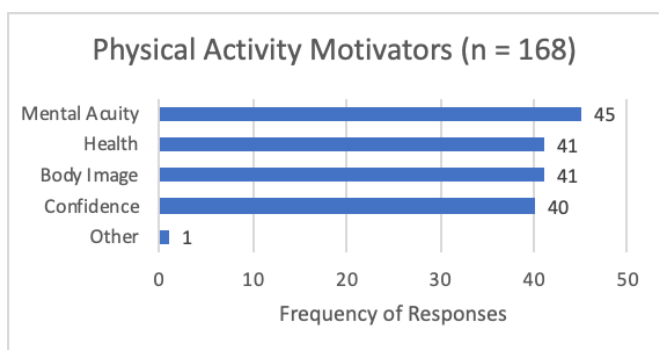


Figure 16

Other Response

If you selected "Other" in the questions above, please specify below

performance in sports

Figure 17

Barriers from MVPA

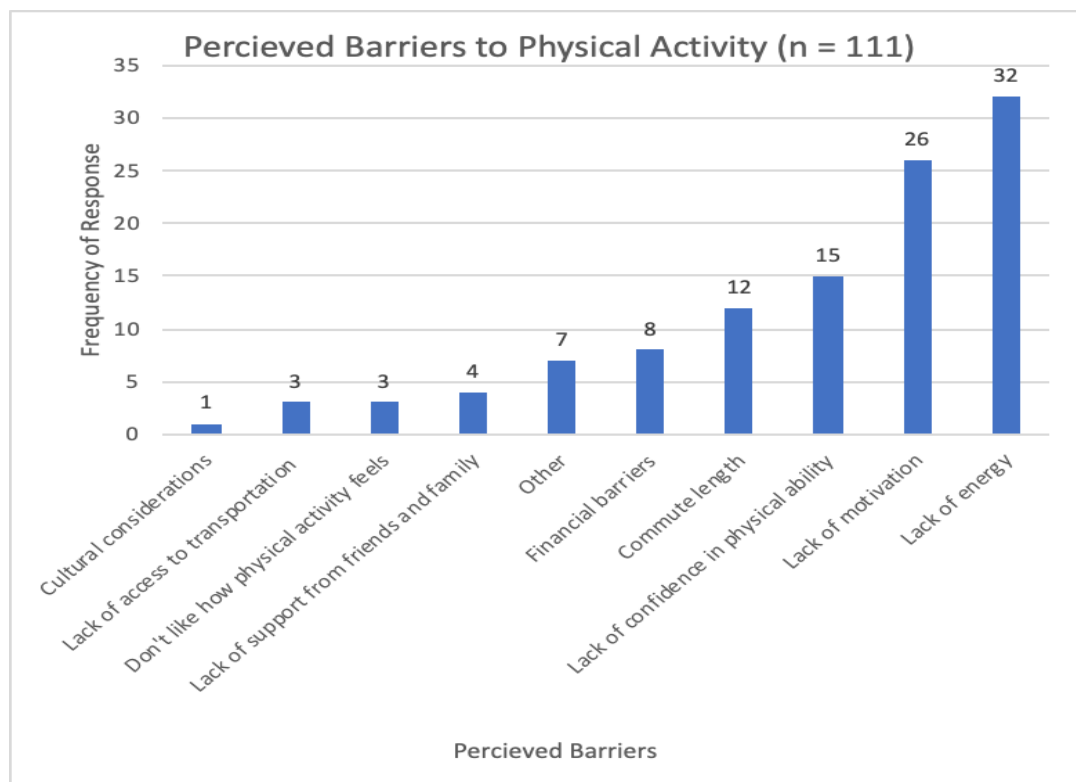


Figure 18

Other Response

If you selected "Other" in the questions above, please specify below

self conscious at the gym

Weather condition

too much schoolwork

The gyms on campus get quite full during peak hours which is sometimes uncomfortable

Lack of time

Time commitment

I do not have enough time to factor in the class, studying and commuting.

No one to go to gym with

Figure 19

Mode of Transport

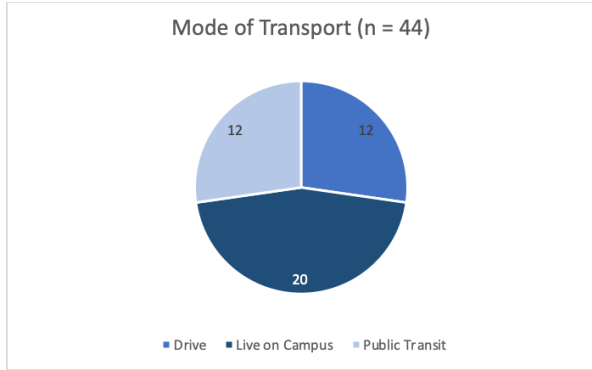


Figure 20

Word Clouds for Qualitative Data

Cultural Considerations that make you more or less likely to engage in PA



Figure 21

UBC Recreation Implementation for suggestions for more attractive and accessible PA

