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UBC Intramurals: Identifying and Assessing Barriers Limiting Female Participation Rates

May Y. Guan^{1,*}, Grace Huang¹, Jennifer R. Lim¹, Jessica A. Pham¹,
Jennifer C. Wong¹

¹ School of Kinesiology, University of British Columbia, Vancouver, BC, Canada V6T1Z3

*Corresponding Author: mayguann@gmail.com

Abstract

Background: At the University of British Columbia (UBC), there is a decreasing rate of female participation in Intramurals sports. **Purpose:** To identify key barriers influencing the decline in women's participation in UBC Intramurals and develop recommendations for UBC Athletics and Recreation to reduce barriers and facilitate female Intramural participation. **Methods:** A 23-question online survey was created with Qualtrics to collect responses from female UBC students regarding their perceived barriers to participation and feedback for UBC Intramurals. Participants were recruited through survey links posted on Facebook. Qualtrics and Microsoft Excel were used to conduct descriptive and content analyses, respectively. **Results:** Common barriers identified by female UBC students included self-esteem and the convenience and accessibility of UBC Intramurals. Three main themes for improvement were identified for UBC Athletics and Recreation and included better access to information regarding UBC Intramurals leagues, consistent league schedules and game times, and the creation of additional leagues, such as gender-specific and just for fun leagues. **Conclusion:** Four recommendations were made for UBC Athletics and Recreation to implement into their current Intramurals program, that being 1) to improve the awareness and access to information regarding UBC Intramurals leagues, 2) create a female hat league to allow small group sign-up, 3) implement consistent schedules for intramurals leagues and games, and 4) increase the types of sports and tiers offered within the program. A mixed-methods study with a larger sample is suggested to help direct further research. **Health & Fitness Journal of Canada 2021; 14(1):61-82**

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Introduction

At the University of British Columbia (UBC), ten intramural sports leagues are available to students (Intramurals, n.d.). In each league, UBC Intramurals offer three categories: an Open division, a Women, Two-spirit, Trans, Gender non-conforming (W2STGN) division, and a co-rec division, in addition to tiers catered to different skill levels. Although

engaging in physical activity (PA) has been shown to have several health benefits, such as decreases in stress levels and increases in strength (Fry, 2017), the number of women participating in UBC Intramurals has been slowly declining (Alyssa Reyes, Personal Communication, January 14, 2020). This may be problematic as women across varying age groups

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already spend less time engaging in PA compared to their male counterparts (Fry, 2017). As a result, certain initiatives have been taken to promote female participation in PA at UBC. For instance, UBC offers a women's division in sports leagues, female-only fitness hours, and female representation in promotional material (Intramurals, n.d.). However, it is also important to identify and address possible challenges influencing the success of UBC Intramurals programs and the barriers that may inhibit women from participating in Intramural leagues.

Psychosocial, physical, and environmental factors influencing participation rates in Intramurals programs have been investigated in students who attend institutions outside of UBC (Krane, 2001; Lemoyne et al., 2015; Sallis et al., 1990). Additionally, the topic of female participation in UBC Intramurals has not been thoroughly investigated. Consequently, UBC Rec may not have the necessary insight to explain the decline in female participation rates observed in their Intramurals programs or to arrange possible solutions to combat this issue. The purpose of this study is to then determine the barriers influencing the decline in female participation rates in UBC Intramurals, specifically in 17 to 25 year old female students. The comparison between commuter and non-commuter students will be emphasized. The online survey will identify possible psychosocial, physical and environmental barriers that female students face, in addition to collecting student feedback and experiences with UBC Intramurals programs. Through descriptive statistics and content analysis of the questionnaire results, recommendations will be provided for UBC Rec to reduce barriers and enhance female participation rates in UBC Intramurals leagues. We hypothesize

that female UBC students will identify environmental factors, specifically the accessibility and convenience of UBC Intramurals programs, as the largest barrier to participation.

Psychosocial Factors

Psychosocial factors such as social media, body image, and self-esteem may explain the decline in female intramural participation. For example, the growing use of social media has influenced the delivery of female representation in sports (Liechty, Freeman, & Zabriskie, 2006). Women have been socialized into acting in a gender-appropriate manner that reflects hegemonic femininity—qualities defined as womanly—and are often pressured into attaining and maintaining a thin body (Krane, 2001). These normalized ideals of women may influence their choice of fitness activities and could result in body weight and body image dissatisfaction (Frederick & Shaw, 1995; Krane, 2001). Research results have also indicated that the physical appearance of a woman may determine their perceived self-worth and status (Guszkowska, 2015). Liechty et al. (2006) found that appearance dissatisfaction was a prevalent constraint in leisure activities, particularly in university and middle-aged women. The authors also found that body-focused activities reduced enjoyment in the choice of leisure sports. The influence of social media in socializing women into normalized ideals and its negative influence on body image and self-esteem in female university students may further explain the reduced number of female participants in intramural sports.

Physical Factors

Physical factors such as an individual's perceived level of fitness and previous sports exposure may impact their decision to participate in PA

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(Lemoyne, Valois, and Guay, 2015). Previous study results revealed that those with high sport competence were more inclined to participate in PA (Buckworth and Nigg, 2004). Lemoyne et al. (2015) conducted a study to investigate the correlation between physical self-concept and participation in PA in 386 college students. It was found that students with higher sport competence were more motivated to partake in sports in comparison to other varieties of PA. Similarly, Molina-Garcia, Castillo, and Pablos (2009) found that students who had prior experiences with PA before entering university expressed high intentions of practicing PA in the future. Thus, it could be expected that female students with a low perceived level of fitness and little experience in sports are less likely to participate in intramural sports (Lemoyne et al., 2015; Molina-Garcia et al., 2009).

Furthermore, Thomas et al. (2019) found that male students participated more in recreational sports, such as intramurals leagues, and competitive sports. Contrastingly, females participated more in fitness-related activities, such as group fitness classes, dance, and yoga. As female university students' interest in fitness-related activities is increasing, it may explain the decline in female participation in UBC Intramurals sports leagues (Thomas et al., 2019).

Environmental Factors

Environmental factors such as the accessibility to recreational facilities that provide indoor and outdoor space for PA may facilitate participation in fitness activities (Humpel, Owen, & Leslie, 2002). Humpel et al. (2002) found that environmental attributes, such as space, aesthetics, and the convenience of the facility, contributed to the likelihood of sport participation. Previous studies also proposed that female participation in

leisure sports may rise with increasing accessibility to sporting facilities (Eime et al., 2017). Additionally, students who live off-campus frequently rely on the use of public transportation to reach recreational facilities (Butler, Black, Blue, & Gretebeck, 2004). However, despite the mode of transportation, the perceived convenience and geographical proximity of sporting facilities is an important factor. Sallis et al. (1990) investigated the distance between homes and exercise facilities concerning exercise frequency in San Diego residents. It was found that although nearby facilities were desirable, factors such as inadequate or paid parking and inconvenient league schedules influenced exercise participation. Subsequently, female students who do not live on campus may choose not to participate in UBC Intramurals if UBC is relatively distant from their home or if the intramurals schedule does not coincide with their own.

Target Group

There are a variety of psychosocial, physical, and environmental barriers that may influence the decline in female participation rates in intramurals (Krane, 2001; Lemoyne et al., 2015; Sallis et al., 1990). However, there has not been extensive research regarding barriers influencing female participation rates in UBC Intramurals and the factors identified in previous literature may not be specific to UBC Rec.

With an increasing trend of sedentary behaviour among university students, it is important to identify and address the barriers influencing female student participation in intramurals sports (Baghurst et al., 2019). According to Becker et al. (2019), 57% of the overall population of UBC students are commuters. In comparison to the students who live on campus, commuter students typically spend less time on

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campus (Becker et al., 2019). Their commute time to and from school may limit their ability to form strong relationships with peers and faculty members and be involved in clubs, events, and programs such as UBC Intramurals (Newbold, Mehta, and Forbus, 2011; Woodley, 2017). According to Szeri and Mathieson (2018), the representative age range of UBC female students is 17 to 25 years of age. Thus, for our investigation, the target group will aim to include female UBC students, ages 17 to 25, with an emphasis on the comparison between commuter and non-commuter students.

Methods

Qualtrics, an online survey tool that formulates multiple-choice, Likert-type, and open-ended questions, was used to create an online survey for the study. Twenty-three questions were generated according to the barriers and success metrics identified in our literature review. Participants were recruited on commonly used online platforms such as Facebook and Instagram (Liechty et al., 2006). The survey link was promoted from March 4th to March 18th, 2020 through word-of-mouth on Facebook Messenger and posts. Informed consent was obtained by each participant, which outlined the research purpose, procedures, outcomes, benefits and risks, and the contact information of the principal investigator. The consent form also ensured the privacy and anonymity of participants' responses before they proceeded to the survey. The survey was open to any UBC students who identified as female. This study was approved by the Research Ethics Boards of UBC and conducted alongside the UBC SEEDS Sustainability Program and UBC Recreation.

Statistical Analysis

A series of questions were proposed to the participants in the online survey, which included general topics regarding their participation in UBC Intramurals and the potential factors that influenced their decision to participate.

Two of the 23 questions were open-ended, where participants were able to voice their concerns and provide feedback or recommendations for UBC Rec and their Intramurals programs. After the two-week data collection period, a total of 92 participants were recruited and had completed the survey. Descriptive statistics and qualitative analysis were used to examine the data. With the use of descriptive analysis, quantitative data was grouped automatically by Qualtrics, in regards to the participants' responses to the survey. Statistical figures were then created using Qualtrics. Additionally, the qualitative data was analyzed using content analysis, where participant responses from the open-ended questions and optional text boxes in the survey were categorized into common themes. Answers related to the options provided were grouped as recommendations for UBC Rec (Table 1; Table 2). From the analysis of our findings, four recommendations and a direction for future research were created for UBC Rec to implement into their current Intramurals program.

Results

Quantitative Data Analysis: Descriptive Statistics

The most common reasons for not participating in UBC Intramurals were inconvenient league times (41.5%), commute time (35%), and the lack of friends to join with (Figure 1). We also discovered that the top four factors that influenced their decision to participate in leagues outside of UBC included convenience (45.7%), accessibility (39.4%), more friends to join with

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(39.4%), and more options in terms of skill level/tier (31.9%, Figure 2).

Figure 1. Frequency graph of the factors for lack of participation in UBC Intramurals

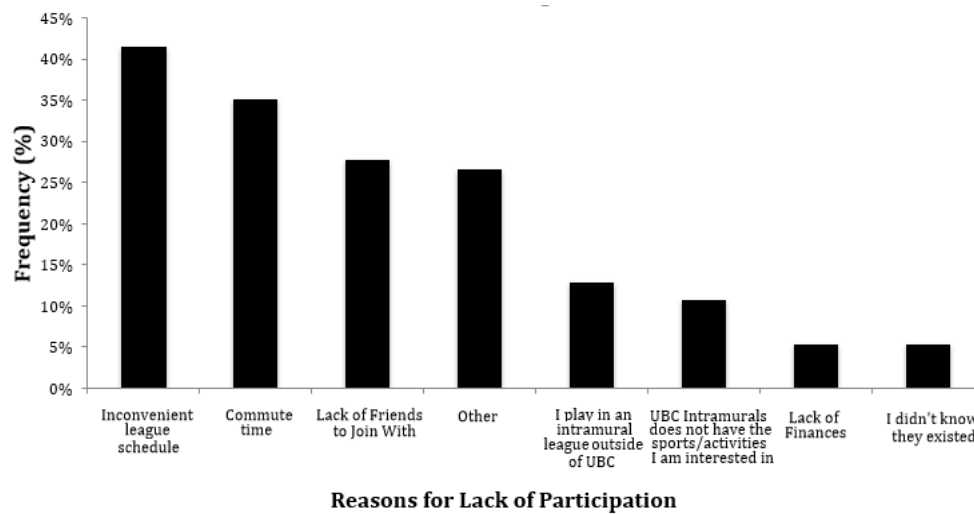
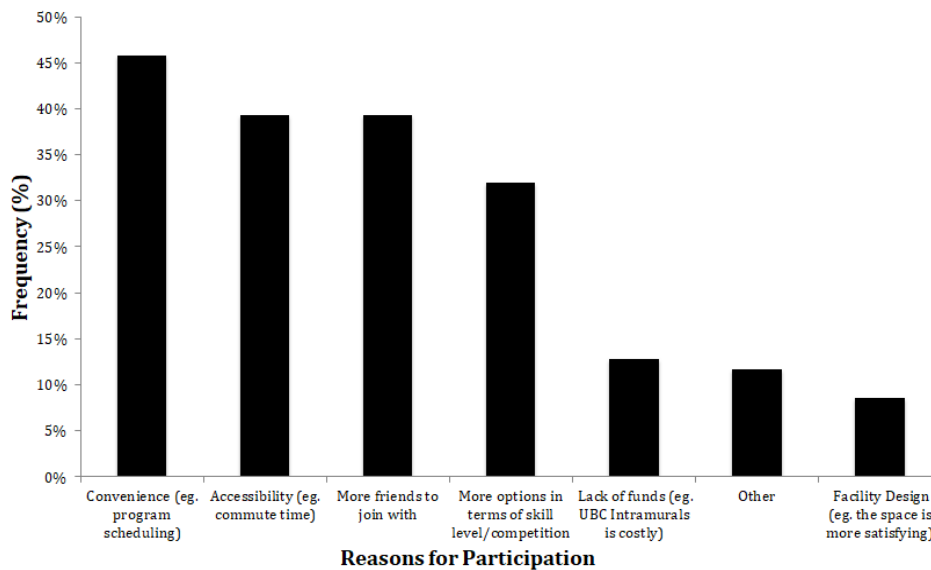


Figure 2. Factors for participation outside of UBC intramurals. Respondents selected all that applied.



Factors that Influence One's Decision to Not Participate in UBC Intramurals

For data analysis, the Qualtrics software was used. When analyzing factors that influence participants' decision to not participate in UBC Intramurals, social media and body image had a non-significant influence on one's decision. However, when considering self-esteem, 40% of the respondents were concerned with their ability to perform well, while 37% were concerned with their ability to effectively

display the skills required for the intramural sport (Figure 3). Collectively, 52% of participants were concerned with their ability to appear confident in the skills required (26.6%) or their ability to succeed in intramurals (25.5%).

When considering the factors concerning the convenience of UBC Intramurals, 47.9% of the responses stated that the scheduling of the league games (e.g. time and day) influenced one's decision to not participate in UBC

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Intramurals. Other common responses included the commute time to UBC Intramural leagues (28.7%) and either or both of the skill level and level of competition of UBC Intramural leagues (21.3%).

Survey respondents also answered questions on how psychological factors influenced their decision to not participate in UBC Intramurals. When looking at past sporting experiences, our data showed that half of the participants disagreed or strongly disagreed that their sporting background influenced their decision to not partake in UBC Intramurals. However, it should be noted that the other half agreed or somewhat agreed that their past sports knowledge had an influence (Figure 4). Additionally, the results suggested that a majority of participants' perceived level of fitness did not influence their decision in not participating in intramurals. However, there were a few respondents that somewhat agreed that their perceived level of fitness influenced their decision (Figure 5).

Despite previous literature, our results displayed that social media had a weak influence on a respondent's decision to not participate in UBC Intramurals (Figure 6). A majority of participants also responded that no aspect of body image influenced their decision to not participate in intramurals, but 22% of the participants

did fear being judged based on their physical appearance (Figure 7).

UBC Rec and Intramurals

With our data, a comparison between commuter and non-commuter students was possible due to a large portion of survey participants being commuter students. Respondents also classified themselves as having previously participated in UBC Intramurals and are not currently participating in a league, or have ever participated in a league (Figure 8).

It was found that a majority of the students that participated in the survey were aware of UBC Intramurals. Although a majority of the survey participants knew about UBC Intramurals, there were still some participants that were unfamiliar as to what UBC Intramurals had to offer (Figure 9).

The participants were asked to provide recommendations to improve female participation rates in UBC Intramural's programs. These factors included scheduling more league times (46.8%), more formats of intramural sports (45.7%), more tiers for different skill levels (43.6%), a wider range of intramural sports (31.9%), and improving UBC Rec's reach and exposure for intramurals programs to students on campus (Figure 10).

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Figure 3. Self-esteem factors that influenced participants' decisions to not participate in UBC Intramurals.

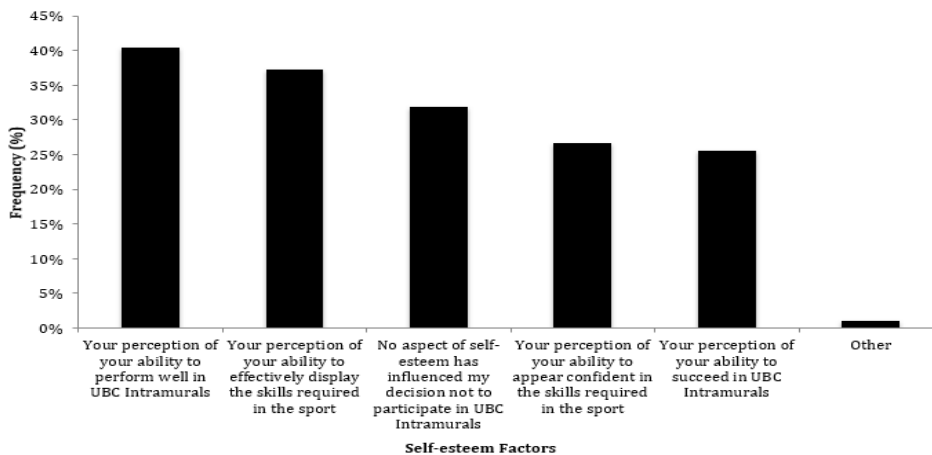


Figure 4. Past sports experiences that influenced participants' decision to not participate in UBC Intramurals.

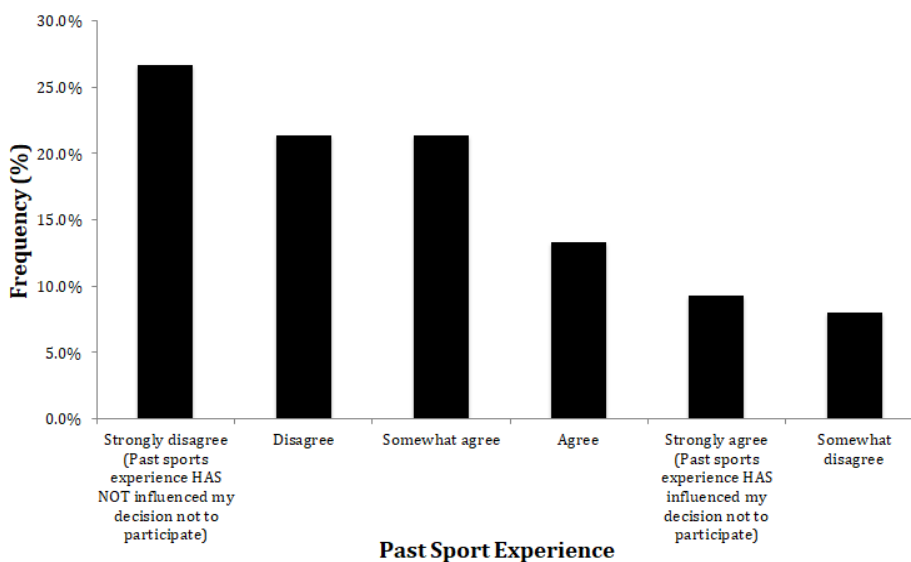


Figure 5. Perceived level of fitness that influenced participants' decision to not participate in UBC Intramurals.

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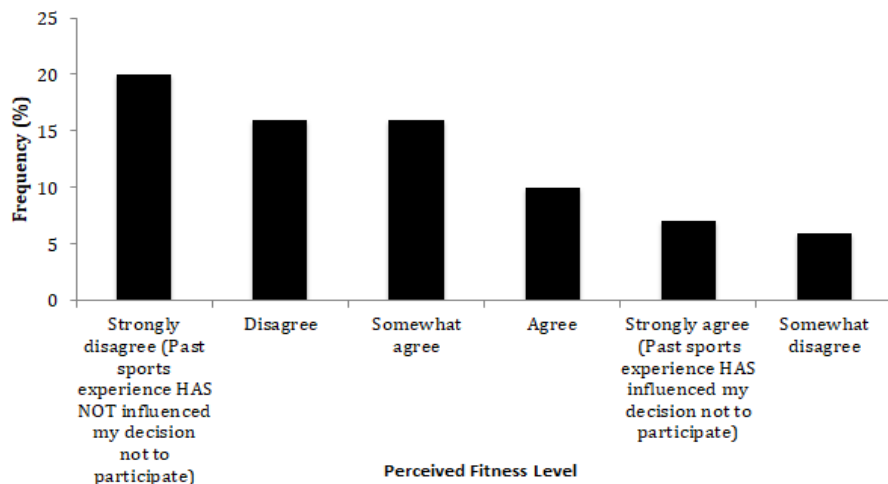


Figure 6. Social media factors that influence participants' decision to not participate in UBC Intramurals.

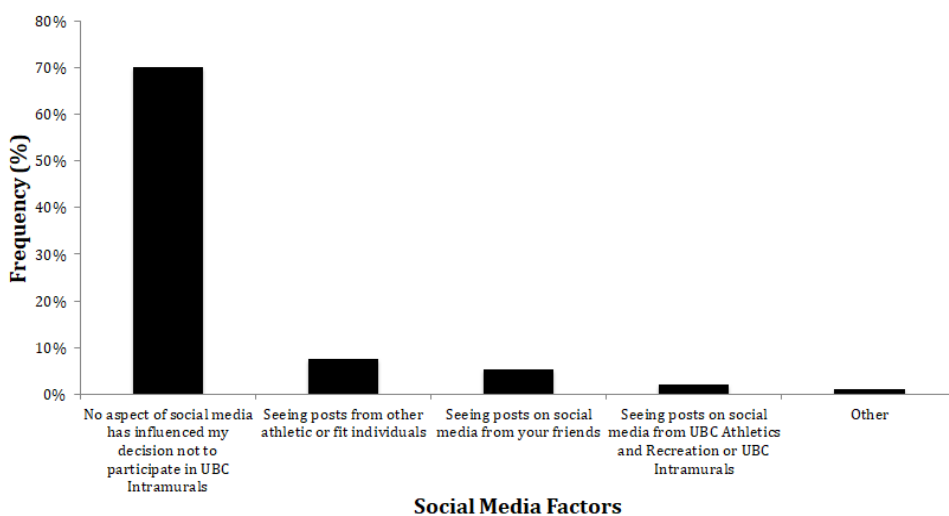


Figure 7. Body image factors that influence participants' decision to not participate in UBC Intramurals.

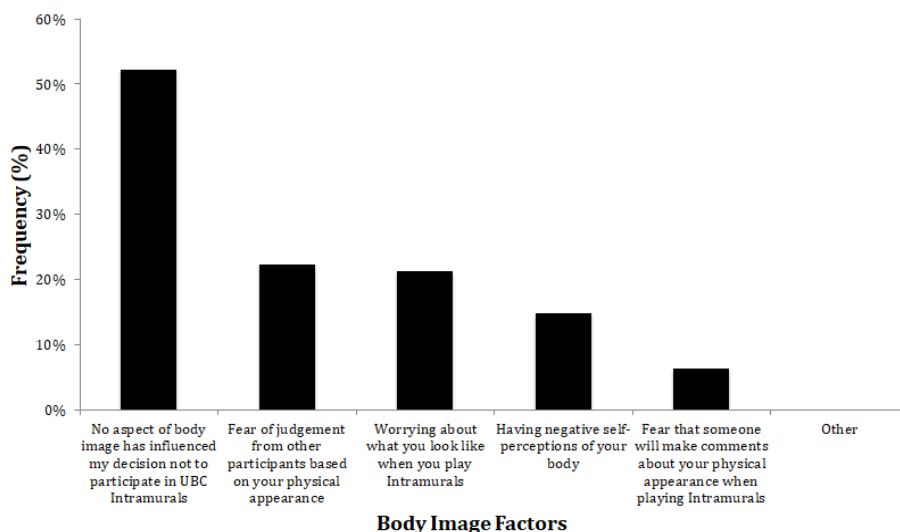


Figure 8. Frequency graph of participation rates in UBC Intramurals.

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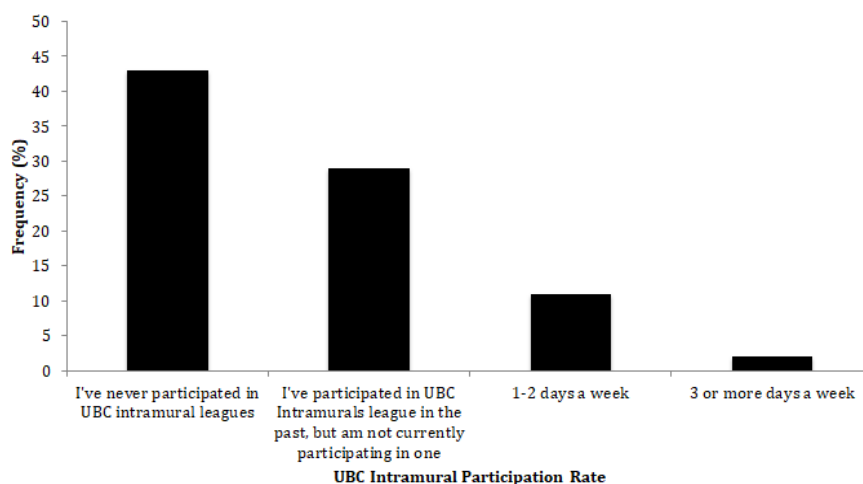


Figure 9. Frequency graph depicting the familiarity with UBC Athletics and Recreation among female students.

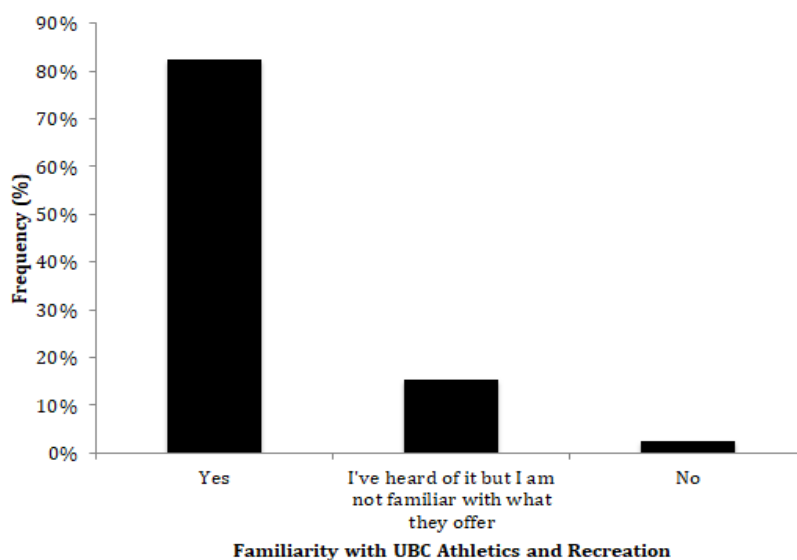
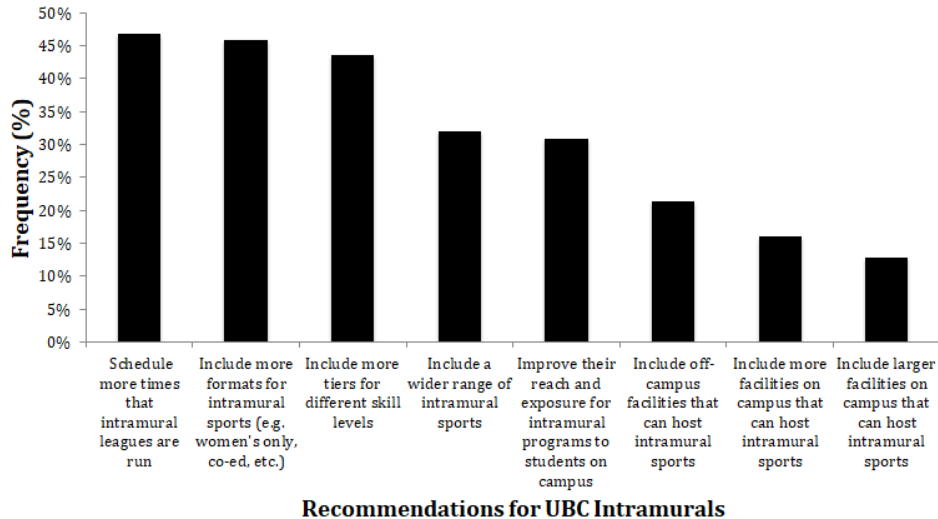


Figure 10. Possible recommendations that could influence the increase of participation in UBC Intramurals.

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Qualitative Data Analysis: Content Analysis. Five themes emerged when participants were asked to suggest recommendations: better access to information about the leagues (i.e. intramurals opportunities, how to join the league or create a team), improvements on scheduling methods, more opportunities for gender-specific and Just for Fun leagues, buffering the intimidation factor of sport, and better facility management (Table 1).

The three major recommendations that received the most feedback included

better access to information regarding UBC Intramurals, scheduling methods, and creating more opportunities for people with different needs. Many participants mentioned that they did not know about the intramural leagues that UBC Rec offered and that advertising such information would be helpful. Similarly, individuals found it difficult or did not know how to join the league “if [they didn’t] already know someone who [was] on an intramural team” (Table 2). Participants suggested referral programs for students who have never joined an intramural league before. In addition, not only was it difficult to join a team, but the process of creating and registering a team was also troublesome for participants. For example, there was

a lack of information regarding the process of registering a team as some participants indicated that they “[didn’t] know how to become [a captain] nor [know] the responsibilities of being a captain” (Table 2). Moreover, the responsibility of being a captain was “pretty troublesome,” which deterred individuals from creating a team (Table 2). Consequently, without a captain, a team cannot be formed in a league.

The second major theme revolved around the scheduling methods of UBC Intramurals. Currently, UBC Rec requires students to register for the intramurals league first, and once the registration period is closed, the schedule is made. Participants are then registering for the leagues despite “schedules not [being] released before signing up and [being] frequently changed during the league” (Table 2). Additionally, an important concern regarding the scheduled time of play is safety. Many female participants voiced their concerns about having league games at night and subsequently having to “walk [or commute] home at night” (Table 2).

The last major theme surrounded the idea of creating more opportunities for people with different needs. This included participants who wanted more gender-specific, Just for Fun, and lower commitment leagues. For example, a participant voiced their opinion that “an

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all-female just for fun league would make [her] join” (Table 2).

Table 1: Open-ended responses for recommendations for UBC Athletes and Recreation.

Are there any recommendations you have for UBC rec that were not mentioned in the question above?	A	B	C	D	E
Make it easier to be a captain	x				
The idea of UBC Rec in general when you are not directly involved is a tight-knit close athletic family so as an average player that is relatively unfit it can feel intimidating or as if it is not being advertised to me. Also, it would be helpful to have lower commitment leagues or on better days as some sports are on the weekend and a commuter full-time student it can be tough to do that when it's the only option for that sport			x	x	
Ensuring cleanliness of the facility before games, floors in the SRC are usually very dusty and can cause injuries for individuals playing sports such as Basketball, dodgeball or volleyball					x
Not super related but being clear at the time and days a specific tier and league they play at. It's quite confusing to give a vague number of days/time that it could be in. some of the times it requires the need to switch tiers.	x	x			
Advertising around accessibility and inclusiveness (if that is true) of intramurals	x		x		
If the lack of staffing is an issue, perhaps using a space and dividing it, for example running volleyball simultaneously with dodgeball, etc.					x

Note: Each answer has been categorized into a factor that was identified.
A: accessibility of information, B: scheduling, C: more opportunities, D: intimidation factor, E: facility management

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Table 2: Open-ended responses for recommendations for UBC Athletes and Recreation.

For the recommendations you chose in the previous question, feel free to expand on any recommendations you have for UBC Rec:	A	B	C	D	E
It is hard to join a team if you don't already know someone who is on an intramural team. Also, no one knew how to make a team when our team leader from the last semester went on exchange. Maybe marketing better when the dates are somehow or more word of mouth would excite people? Also, we had to play a couple games past 6 or something; there should be a 'when to meet' type of thing for intramurals, let the players choose the best days for their sport	x	x			
Need more captains that can rally people together to participate	x				
If there was an option of 1-2 days of the week where a team may be scheduled for a particular league I believe this may increase people's motivation to participate. For example, I can no longer play with my Women's Only Basketball team because games always happen Monday nights and I have a 3-hour evening lecture. If this league happened on both the Monday and another day of the week, there would be more opportunity for individuals like me to participate.		x			
More education about how to sign up that is readily available in first year! Also maybe a referral program for people who have never played before.	x		x		
Perhaps having a special intramural event for girls only			x		
In my experience I've just been hesitant to join because I don't know about intramural and since I don't have much friends interested in sports or athletics, I have always looked towards individual activities (like gym memberships and classes) instead of looking toward joining a team. I guess being a part of intramural wasn't really on my mind beforehand.	x			x	
Schedule during daylight hours so women don't have to walk home at night		x			
Times that are not late at night		x			
The scheduling is a major issue as schedules are not released before signing up and frequently changed during the league	x	x			
Could include participation in tournaments with a women's bracket (i.e. Storm the Wall)				x	
I think having these recommendations would make it more convenient for students to participate in intramurals. As a student who do not participate in sports, I find it intimidating				x	
An all female just for fun league would literally make me join			x	x	

Note: Each answer has been categorized to a factor that was identified. Answer legend replicates Table 1.

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Discussion

The overall goal of our survey was to use the data we collected to investigate and gain a better understanding of the potential barriers influencing women's participation in UBC Intramurals. By gathering more information about these barriers, we can provide recommendations to UBC Intramurals to help reduce barriers, increase female participation rates, and better understand why female participation in intramurals is decreasing.

Initially, we planned to collect data on female students between the age of 17 to 25, however, we realized that our survey was more suitable for the broader range of female students at UBC. A comparison between commuter and non-commuter students was still possible due to a large portion of survey participants being commuter students.

The knowledge gap about UBC Intramurals could be related to the lack of information surrounding how to register for a team and the programs and leagues offered (Table 2). Increased exposure and the promotion of UBC Intramural programs would then have a significant role in raising awareness in female students. Similarly, the results suggest that UBC Intramurals must improve its reach and exposure of intramural programs to students on campus. With the data collected, common themes had emerged concerning the targeted factors that have been previously described in the literature. This included schedule conflicts, building accessibility, commute time, social media, and student self-perception and confidence that may have influenced intramurals participation (Eime et al., 2017; Humpel et al., 2002; Lemoyne et al., 2015; Liechty et al., 2006).

In the data collected, we found that having more available time slots for intramurals leagues would be beneficial

for participants. Through our open-ended questions, participants brought up the idea of having a variety of available times for intramural games, where certain times and days were allocated for a specific tier (Table 2). This suggests that participants would prefer a completed schedule prior to the registration period. Without the security of knowing scheduled game days, feelings of uncertainty may arise for the participants and may deter them from committing to the leagues. Having a set schedule may enhance female participation numbers as students can incorporate and adjust their school schedule and personal life around the intramural games.

In relation with the scheduled time of play and commute time, safety becomes a concern. Having to commute to or from campus during evenings and nights deters female participants from joining the league if they perceive their safety to be at risk. If games were scheduled at more suitable times, perhaps more female participants would feel inclined to join an intramurals league. As well, commute time may take up a large fraction of an individual's day, therefore having a predetermined schedule could potentially increase their participation.

With commute time and mode of transportation being factors influencing women's participation, the accessibility and location of UBC facilities is also a contributing factor. Humpel et al. (2002) found that the accessibility of recreational facilities can help facilitate participation in fitness activities. Earlier literature also proposed that female participation in leisure sports could rise if there were increasing accessibility to sporting facilities (Eime et al., 2017). As survey respondents were mostly commuter students, our results suggest that UBC Intramurals should encourage and promote intramurals leagues to female student residents on campus, as

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facilities would be the most accessible and convenient for this demographic of students.

Additionally, our results suggest that UBC Intramurals should include more team categories, tiers, and types of sports in their leagues. UBC Rec currently has competitive, recreational, and Just for Fun teams with 10 league categories available to students (UBC Recreation, n.d.). Recreational and Just for Fun leagues differ in that recreational teams are similar in all aspects of competitive teams but are played at a lower intensity and students typically have beginner to intermediate skill level in the sport. On the other hand, Just for Fun teams eliminate team structure and tiers (UBC Recreation, n.d.). Both competitive and recreational teams include an Open category, a Women's (W2STGN) category, and a Co-Rec category (UBC Recreation, n.d.). The Open category welcomes all individuals to participate regardless of gender, whereas the mixed Co-Rec category has a maximum number of self-identified males on each team. Within each sport, there are also different tiers. There are currently three competitive tiers within the leagues, however, not all tier options are offered in all the leagues (UBC Recreation, n.d.). From the information gathered, results indicate that respondents wanted to incorporate a wider range of sports to the leagues as well as various tiers for different skill levels. Additionally, different team categories in intramurals were also preferred, specifically an all-women's team. However, as there is currently a W2STGN category available, the knowledge gap surrounding intramurals is present. With survey participants being unaware of the tiers and categories offered by UBC Intramurals, the interest of having more team categories could be addressed with further education and

promotion of UBC Intramurals programs.

Furthermore, our findings suggest that there is an intimidation factor amongst our survey participants. Some of the factors that we provided in the survey included an individual's perceived level of fitness, past sports experience, and overall body image and self-esteem. These psychological factors may potentially be generalized to the larger female UBC population as there has been an overall decline in UBC Intramurals. The need for more gender-specific, Just for Fun, and lower commitment leagues may have been presented due to feeling intimidated in joining UBC Intramurals. Some participants may have a fear of being judged and intimidated by others and those of the opposite gender. Although there is a W2STGN category, some female students may feel that an all-women's league is necessary. If there were more opportunities for female students to participate with other females in specific intramural leagues, it may improve female participation rates in UBC Intramurals.

Previous literature also supports the idea that female students with a low perceived level of fitness and little amount of experience in sports are less likely to participate in intramural sports (Lemoyne et al, 2015; Molina-Garcia et al., 2009), but our data suggested otherwise.

Moreover, as earlier research has demonstrated, the growing use of social media has influenced female representation in sport (Liechty et al., 2006). With social media being one of the factors we identified as being a potential barrier in women's participation, an individual's body image and perceived level of fitness could also be impacted. Despite previous literature, our results displayed that social media had a weak influence on a respondent's decision to

not participate in UBC Intramurals. Additionally, although the majority of participants responded that no aspect of body image influenced their decision to not participate in intramurals, some participants did fear being judged based on their physical appearance. It is then plausible that some psychosocial factors could instill a sense of intimidation and fear in some individuals' decisions to engage in the leagues facilitated by UBC Intramurals.

Challenges, Limitations, and Possible Improvements to the Study Design

Some limitations and challenges that were presented throughout the course of our study included data collection and analysis, disadvantages of using online surveys, reporting biases, and the inability to maximize the external validity of our survey.

Data Collection and Analysis

Evaluating data as a whole team was difficult as Qualtrics limited data access to the member that created the survey. While there was an option to allow all group members to view the data, it did not comply despite troubleshooting. As such, the raw data was extracted and inputted into a Microsoft Excel document for the rest of the team to view.

Additionally, with the use of online surveys to collect our data and the assumption that the recruited participants were current female UBC students who were the average age of 17-25, it was difficult to confirm the true age of each participant as we did not include survey questions that asked participants to provide their age. This was done to help ensure the privacy and anonymity of the participants' responses.

Disadvantages of Using Online Surveys

When creating our online survey, a majority of the questions were tailored towards three barriers identified in previous literature (Krane, 2001; Lemoyne et al., 2015; Sallis et al., 1990). This may be disadvantageous as there may be other factors or barriers resulting in a lower female participation rate in UBC Intramurals. We attempted to address this challenge by providing participants with an optional text box for any factors that were not included in the original survey options. However, participants may have chosen to select options already embedded in the question if they found it inconvenient to type out an answer. Surveys may also be disadvantageous as responses may not be as insightful compared to interviews. We chose to create a short online survey as it was a convenient option for students to complete while also providing valuable information for our analysis and recommendations. However, if we were to re-run this study, an option would be to conduct a mixed-methods study that included a broader survey addressing barriers and semi-structured interviews with female UBC students to gain further insight into their experience with UBC Intramurals. This would also help enhance our data analysis and subsequent recommendations we could provide to UBC Rec as we would have unmediated information from students who do and do not participate in UBC Intramurals.

Reporting Biases

The analyses conducted on the data we gathered may be susceptible to response biases, the tendency of an individual to answer questions on a survey untruthfully or misleadingly (Kowalski, McHugh, Ferguson, & Sabiston, 2018). To address this challenge, we ensured that prospective participants were aware that their

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responses remained anonymous in the consent form. However, as we had no method of validating participant responses, we could not rule out any participants who may have had agreed to statements or questions that they found difficult to understand (i.e. acquiescence; Kowalski et al., 2018).

During our data analysis, we found that participants often included responses in the optional text box that was similar to options already provided in the original survey. In future studies, we would create a survey with additional questions that addressed each of the barriers more specifically so participants could understand each option before choosing a response. Another change would be to structure our survey questions more articulately to avoid confusion when choosing a response and prevent response biases.

Inability to Maximize the External Validity of the Study

Our ability to maximize the external validity of our study was impacted as our target group initially focused on female UBC students between the age of 17 and 25. Specifically, our study may produce low population validity: a type of external validity in which findings from a sample can be generalized to the broad population (Kowalski et al., 2018). Therefore, we would have difficulty generalizing our findings and recommendations to all the female students who attend UBC due to a small target group that only represented a fraction of the total population at the university.

To address this limitation in a future study, we would include a larger demographic of female students at UBC. For example, by not restricting the age range of our target group and recruiting more students into our study, we would be able to further generalize our findings to a broader population. Informed assent

would also be provided for students who are under the age of 18. Additionally, promoting our survey using other methods, such as posters, may help recruit students who do not use social media platforms. A broader target group would also allow us to gain more insight into the barriers perceived by female students when participating in UBC Intramurals. Lastly, the recommendations that we make from our findings and analyses would provide a more accurate representation of what female students at UBC are looking for in an intramural sports program if a larger demographic of female students were recruited.

Conclusions

To enhance female participation rates and reduce barriers to participation in UBC Intramurals programs, four main recommendations have stemmed from our research. Two short-term recommendations that UBC Rec may implement into their current Intramurals programs include improving access to information regarding UBC Intramurals programs and introducing a hat league during sign-up and registration. In addition, two long-term recommendations that UBC Rec may work towards involve developing a consistent league schedule for each sport and offering a wider range of formats and sports options for students. Lastly, suggestions for future research surrounding this topic are provided.

Improving Awareness and Access to Information Regarding UBC Intramurals Leagues

One of the first short term recommendations that UBC Rec can implement promptly would be to improve access to information regarding intramurals league opportunities, registration, and the responsibilities of

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being a captain. This recommendation relates to the concept of “Making the Healthiest Choice, the Easiest Choice” — if the information is made to be more accessible, then it may enable more students to engage in intramural leagues efficiently and with ease (World Health Organization, 1986).

From our findings, it was apparent that many participants lacked awareness of intramural leagues organized by UBC Rec. Therefore, promotional topics could include informing students on the types of sports and tiers offered by UBC Intramurals, educating students on how to sign up for an intramural league, or educating students about the responsibilities of a captain role.

With respect to the methods of promotion, UBC Rec often has booths set up in various locations across campus, with student staff members who provide information and answer questions regarding the services and events run by UBC Rec. Additional recommendations for promoting UBC Intramurals programs would include having female student advocates to encourage other female students to join the leagues.

Through peer encouragement, student advocates can promote recreational and intramurals programs effectively by creating a welcoming and personable environment for female students (Brunton, 2016). However, more posters or media-based methods may also help promote UBC Intramurals and reach female students who may not feel comfortable approaching the booths on campus. For example, UBC Rec could create short videos about the leagues offered by UBC Intramurals or demonstrations on how to create and register an intramurals team. It could be advertised on social media, such as Facebook or Instagram, as students frequently use these platforms. In addition, posters or infographics could be created to encourage students to join

UBC Intramurals leagues and be posted in populated areas on campus, such as The Nest, the Life Building, or near the bus loop.

Additionally, UBC Rec currently has a Facebook group created for free agents in which students can look for more teammates to join their teams, and vice versa, for individuals to look for a team to join. However, another option would be to create a separate Facebook group or page that is dedicated to promoting UBC Intramurals leagues and providing first-timers with a safe space to ask questions. This may be beneficial for increasing female student awareness and participation rates as it creates more dialogue for participants to connect, thus making registration for a league less intimidating, and can be used to provide more information for existing intramural leagues. Having a Facebook group or page managed by UBC Rec would also facilitate a welcoming environment for students to search for necessary information and could also be promoted through other official UBC social media outlets.

A goal that could be directed toward this recommendation is an increase in female students' awareness and an increase in women's participation in UBC Intramurals leagues. After introducing new methods of promotion, a campus-wide survey could be created and distributed to students and indicators could include the number of female students who know about the leagues offered by UBC Intramurals, who know how to register an intramurals team, and the number of female students currently registered or are interested in registering for an intramurals league.

Creation of a Female Hat League Sign-Up

Another short-term recommendation is the creation of a hat league. From our results and discussion, a common theme

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for female students who decided not to participate in intramurals included the lack of interested friends to sign up with. This may occur when team captains fail to recruit enough players to register or when a free agent struggles to find a team to join for the league. To address these issues, a female hat league could be created where female students can register for a league as a solo, pair, or trio, and the league organizers would sort them into random teams together. To have an equal level of skill across the teams, a number can be assigned to each student who registers, and higher numbers would represent those who are more advanced in the sport.

As intramural leagues are a source of PA, having a hat league would be a healthier choice, as participating in an hat league would require less work for female students to find a team. Another benefit of implementing a female hat league includes the social benefits that the participants may gain. For example, if participants were to sign up as a pair, they would remain with their partner throughout the league, but would also get an opportunity to meet new teammates. This may cultivate new friendships with individuals that they may have never encountered before. In turn, the individuals they meet during the hat league could eventually form the building blocks of a consistent team in an intramurals league. Another advantage of a female hat league is the shared learning that may occur amongst the team. For example, higher skilled players can educate newer players regarding the sport. This can increase a new player's perceived level of fitness and their overall confidence in their ability to perform skills and be successful. These benefits will target the individual level within the social-ecological model.

The success of a female hat league can be evaluated with a survey at the end of the league, which will gauge the

satisfaction of the female students who participated in the league. Possible indicators include satisfaction with the league, plausibility to return to the league in the upcoming term, and the likelihood of recommending the league to others. The success of this recommendation may be based on these indicators, where the decision to continue the hat league can be decided. A long-term indicator for the success of a female hat league is an increased number of female students participating in other intramurals leagues offered by UBC Rec. The hat league may serve as a stepping stone between those who do or do not decide to participate in intramurals leagues offered by UBC Rec.

Consistent League Schedules and Game Times

A long-term recommendation that UBC Rec may implement includes having consistent league times throughout the school year. Through the use of our open-ended questions, the results of our survey suggested that female students preferred having consistent league times. Currently, individuals are given a few days in the week and a range of times for when their league games may occur. To participate in the league, players must keep their availability open to avoid schedule conflicts. With the current scheduling format, individuals are unable to plan out their week due to the variability in game time. As inconsistent league times may be inhibiting female students from participating in UBC Intramurals, we recommend that UBC Rec develops consistent and specific time slots and days for games in each tier or category, prior to the registration period. This can be implemented by using the dates that are already set for each sports league as a reference. By having a consistent time each week for their league, participants can adjust their personal schedules to avoid any

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conflicts. If students are opposed to the scheduled times and dates, UBC Rec can distribute a survey to students to determine the most preferred times for each league. It has been found in previous literature that universities that encourage and incorporate student feedback regarding program scheduling, found success in increasing female participation in intramural sports as adjustments were made to best suit the schedules and needs of students (Stoll, 2010). A way for UBC Rec to measure whether this recommendation has succeeded is to see an overall increase in female participation in intramurals leagues.

However, it may be difficult to accommodate the preferred times and days for each sports league. Therefore, another recommendation could be to notify teams in advance of their next scheduled game. For example, an email reminder could be sent to each team member a day before their game. Under the social-ecological model of health, by changing the social environment, for example, the scheduling of the league games, individual factors can be better managed. These individual factors may include school, work, or extracurricular activities. As a result, this may ultimately change the health behaviour of female students as they would be more inclined to participate in UBC Intramurals.

Introduction of New Sports Leagues and Additional Tiers

The second long-term recommendation for UBC Rec is to increase the number of sports leagues offered within the intramurals program, and to increase the number of tiers available for each sports league. This would include a larger range of skill levels, such as more Just for Fun tiers or women's only tiers. One way this may be implemented is to hold test trials for certain sports leagues that are not

currently being offered for a short period of time. As seen in our survey, self-esteem had a prevalent influence on female students' decision to participate in UBC Intramurals. Therefore, incorporating more tiers that vary in different skill levels or a women's Just for Fun may create a more inclusive environment that allows female students to lower feelings of intimidation or the fear of judgement from others.

Additionally, through our survey results, many participants suggested that the incorporation of different formats, more tiers for different skill levels, and a wider range of sports would increase female participation. Therefore, UBC Rec could benefit from these additions to their current intramural's programs. Implementation of this recommendation requires collaboration from multiple stakeholders within UBC Rec. This may include marketing organizers, program organizers, volunteers, and participants. Integrating additional sports into the intramural programs requires copious amounts of planning, organizing, and execution from the core stakeholders (UBC REC). Communication and cooperation between stakeholders are then needed to ensure the success of these trial runs. Furthermore, Move U can also support UBC Rec's implementations to their intramurals programs through campaigns to increase female student awareness on campus and in classrooms. Incorporating these recommendations may improve female participation rates as student interests are being met and efforts are put into expanding student awareness of intramurals programs.

Guidelines for Future Research

Aside from the listed recommendations to increase female participation rates in UBC Intramural programs, guidelines for further research on this topic were also created.

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In the process of conducting this research study, there were challenges during data collection and analysis. As outlined, there were disadvantages in solely using online surveys where we were unable to gain detailed responses of female students' experiences with UBC Intramurals. Additionally, due to having a restricted sample size, the extent to which the recommendations and strategies outlined in this research paper may be generalized to the entire female UBC population are limited. To reduce these barriers, future research should be conducted through a mixed-methods study with a different instrument to obtain in-depth data. Specifically, semi-structured interviews can be used to gain further insight into participants' experiences related to UBC Intramurals, along with online surveys. Furthermore, future research should be conducted on a larger sample to examine whether the recommendations addressed in this research paper can be generalized to the entire female UBC population.

In conclusion, in this study, participants answered questions about whether physical, psychological and environmental factors influenced their decision to not participate in UBC Intramural. Based on our findings, four recommendations have been made to UBC Intramurals in hopes to address barriers to female participation and to also provide guidance in further research.

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The authors' qualifications are as follows: May Y. Guan BKIN; Grace Huang BKIN; Jennifer R. Lim BKIN; Jessica A. Pham BKIN; Jennifer C. Wong BKIN.

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