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ORIGINAL RESEARCH

College Student Physical Activity: A Systematic Review

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ABSTRACT

The purpose of this review was to systematically review the published research on the effect of physical activity (PA) interventions on PA behavior among university students. A PA intervention was defined as participants engaging in PA and measuring changes in PA from pre- to post-intervention. Studies were eligible for inclusion if they were (1) published in peer-reviewed English-language journals, (2) included undergraduate university students, (3) implemented a PA intervention, and (4) assessed PA via self-report or direct measures. Fourteen studies met the inclusion criteria and were analyzed in this review. PA interventions were more effective than other techniques or control settings in improving PA behavior in university student participants. The review discusses sample characteristics, study design, PA behavior measurement, PA intervention implementation, and the theoretical frameworks of the studies, along with limitations of the research and suggestions for future researchers.

Keywords: university; physical activity; exercise; interventions; behavior change

INTRODUCTION

There are a wide variety of difficulties that high school students experience as they transition to college. The progression to higher education is associated with social independence, financial burdens, academic difficulties, and novel peer influence, many of which have a negative impact on overall health and well-being (Britt et al., 2017; Ruthig et al., 2011; Wilhite, Ashenhurst, Marino, & Fromme, 2017). Students exhibit increases in weight gain and alcohol intake, poor nutritional choices such as excessive snacking, fast food intake, and skipped meals, inadequate sleep, and higher substance abuse as they progress to college (de Vos et al., 2015; Feng et al., 2014; Gropper et al., 2012; Wilhite et al., 2017). Many of these difficulties in behavioral self-regulation have a negative impact on overall well-being. For example, university students have higher levels of obesity and chronic diseases, such as heart disease, stroke, and Type 2 diabetes than previous generations of students (Barsell et al., 2018; Clarke, Norris, & Schiller, 2017). The current generation of university students also exhibits a greater prevalence of social isolation, stress, anxiety, depression, suicide ideation, and suicide attempts than past students (Twenge, 2017; Twenge et al., 2018). Furthermore, college students report a higher prevalence of mental illnesses such as anxiety, depression, and stress, along with higher smoking prevalence and binge drinking, when compared to their non-college counterparts (Carter et al., 2010; Kovess-Masfety et al., 2016; Sidani et al., 2019). While students experience poorer physical, emotional, social, and mental well-being throughout college, engaging in daily PA has been found to improve all aspects of overall health (Institute of Medicine, 2013). Understanding regular physical activity habits are necessary to then provide programming to counteract many of the unhealthy behaviors of college students.

Regular PA behavior, or meeting the recommended 150 minutes of moderate-to-vigorous aerobic activity and two days of muscle and bone-strengthening activities per week, is associated with the prevention and amelioration of symptoms of stress, anxiety, and depression in university students (Asmundson et al., 2013; Bailey, Hetrick, Rosenbaum, & Purell, 2017; VanKim & Nelson, 2013). Furthermore, sufficient PA behavior promotes cognitive functioning, quality of life, and academic achievement (Kelly et al., 2014; Pedersen & Saltin, 2015; Pedisic et al., 2014; Wald, Muenig, O’Connell, & Garber, 2014). Although there are a wide variety of cross-sectional, randomized control trials (RCTs), and reviews that have examined the benefit of regular PA, most of these studies have combined university students with adult populations or specifically focused on children (Asmundson et al., 2014; Biddle & Asare, 2011; Rebar et al., 2015; Rhodes et
al., 2017; Rosenbaum, Tiedemann, Sherrington, Curtis, & Ward, 2014). As discussed earlier, undergraduate students are in a life stage of transition, which is different from that of children, adolescents, adults, and older adults. Most PA research has investigated the potential impact of interventions on clinical samples as well, rather than nonclinical samples (Josefsson, Lindwall, & Archer, 2013; Rosenbaum et al., 2014).

A review of PA research within the past 10 years has not been conducted with the current generation of university students (Bailey et al., 2017; Henley, Sealy, Hopp, & Brown, 2016; Park, 2014; Pedišić et al., 2014; VanKim & Nelson, 2013). The purpose of this review was to synthesize the published research on the effect of PA interventions on PA behavior among undergraduate university students.

**METHODS**

This systematic review protocol was prepared in accordance with the Preferred Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P) 2015 statement and was reported using the PRISMA statement as guidance (Moher, et al., 2015).

**Eligibility Criteria**

A systematic review of peer-reviewed literature published from 2010 to July 2020 was conducted. Studies were only included from 2010 to explicitly examine one generation of undergraduate students and to include the most recent interventional research. Generation Alpha includes students born in 2010 and afterward (McCrindle & Fell, 2019). Studies were eligible for inclusion if they were 1) published in peer-reviewed English-language journals, 2) included undergraduate university students, 3) implemented a PA intervention, and 4) assessed PA via self-report or direct measures. Studies included original research articles, qualitative studies, and did not have to include a control group.

**Information Source**

Literature was gathered from the following databases: (1) PubMed, (2) Psych Info, (3) Sport Discus, and (4) Google Scholar. These databases were chosen due to their coverage of physical health, school wellness, and education domains (Booth, Papaioannou, & Sutton, 2012).

**Search Strategy**

The systematic search was conducted on the four electronic databases to identify all relevant studies published after 2010 that examined the impact of university PA interventions on PA behavior. The search strategy (see Table 1) included search terms that were created using similar review parameters definitions and guiding definitions (Keating et al., 2005; Irwin, 2004). The search terms fell into two content categories (university PA or exercise). PA and or exercise search terms were first applied to narrow the search process specifically to find articles that assessed undergraduate university PA or exercise intervention work. Additionally, physical health terms (e.g., BMI) were subsequently added to narrow the search to address specific outcomes related to undergraduate university PA interventions. One term per content category was entered per search field until all combinations of terms across the categories were exhausted.

<table>
<thead>
<tr>
<th>University Terms (Category 1)</th>
<th>Activity Terms (Category 2)</th>
<th>Physical/Mental Health Terms (Category 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• university</td>
<td>• physical activity</td>
<td>• well-being</td>
</tr>
<tr>
<td>• college</td>
<td>• exercise</td>
<td>• physical health</td>
</tr>
</tbody>
</table>

**Note.** Example searches: (1) university + physical activity + physical health; (2) college + exercise + program

**Study Selection, Data Collection, and Extraction**

Figure 1 presents the flow chart for the selection of the included studies. To determine the eligibility of the studies, the research team screened titles, abstracts, and full-text articles in a sequential manner to determine potential relevance using the inclusion criteria of university PA interventions. After screening and review, all potentially relevant full manuscripts were retrieved and screened for inclusion (n = 60). Once the list of potentially relevant studies was compiled, titles, abstracts, and full-text articles were reviewed to determine if the articles met the aforementioned inclusion criteria. At this stage, articles were excluded if they 1) were not published in English, 2) did not implement a PA intervention, 3) did not measure PA with self-report or direct measures, or 4) did not limit recruitment to undergraduate university students. Any article called into question was deliberated by two reviewers (e.g., did the article meet inclusion criteria) until
agreement was met. After a thorough evaluation, all relevant articles \((n = 14)\) were obtained and were organized by number and type of undergraduate university PA program in a Microsoft® Excel spreadsheet (Microsoft Corporation, Redmond, VA).

![Figure 1. Identification of Included Studies](image)

*Note:* For more information, visit [www.prisma-statement.org](http://www.prisma-statement.org)

**Data Synthesis**

A narrative synthesis with tabular presentation was used to analyze and present the data. Study results were tabulated into six sections by: (1) sample characteristics, (2) theoretical framework, (3) research design, (4) measurement of PA, (5) intervention duration and adherence, and (6) PA intervention outcomes. A narrative synthesis of these results is included as well. Data collection, extraction, and synthesis was conducted by all four authors, ensuring reliability and validity of the included studies.

**RESULTS**

A total of fourteen studies met the search criteria of a university-based, PA intervention that measured change in PA. Table 2 provides an overview of the reviewed studies that encompass references, sample characteristics, theoretical frameworks, interventions, measurement of PA, intervention duration adherence, and PA intervention outcomes.

**Participant Characteristics**

All of the included research studies included undergraduate university student participants. The total number of participants in the fourteen studies was 1,451 and the mean number of participants was 104. The smallest sample size was 5 (McFadden et al., 2017) and the largest sample size was 408 (Quintiliani et al., 2010). Only nine of the fourteen studies reported the age of participants, and the average age was 20.07 years (Brown et al., 2014; Mackey et al., 2014; McFadden et al., 2017; Melton et al., 2016; Myers et al., 2011; Pfeffer & Strobach, 2018; Sharp et al., 2016; Weinstock et al., 2014; Weinstock et al., 2016). On average, 25.21% of participants were male and 74.79% of participants were female. Furthermore, only seven of the fourteen studies reported participant race (Mackey et al., 2015; Melton et al., 2016; Myers et al., 2011; Quintiliani et al., 2010; Sharp et al., 2016; Ulla Diez et al., 2012; Weinstock et al., 2014). Across these studies, an average of 29.05% of participants were African-American, 45.58% were White, 16.67% were Hispanic, and 10.86% of participants reported as Other.
Intervention Components

The fourteen PA interventions were conducted over various durations (M = 8.47 weeks, Median = 8 weeks, Range = 1-24 weeks). Three of the interventions were relatively short in duration (≤ 1 month) and included 1 week (n = 2, Pfeffer & Strobach, 2019; Ulla Diez et al., 2012) and 4 weeks (n = 3, Quintiliani et al., 2010). Five of the interventions were moderate in duration (1-2 months) and included 6 weeks (n = 2, Melton et al., 2016; Wadsworth & Hallam, 2010) and eight weeks (n = 3, McFadden et al., 2017; Weinstock et al., 2014; Weinstock et al., 2016). The remaining six interventions were long in duration (≥ 2 months) and included 10 weeks (n = 1, Topp et al., 2011), 11 weeks (Myers et al., 2011), 12 weeks (n = 1, Sharp et al., 2016), 16 weeks (n = 1, Annesi et al., 2017), 20 weeks (n = 1, Brown et al., 2014), and 24 weeks (n = 1, Mackey et al., 2014). The shorter-duration interventions (100%) all reported significant increases in PA for the treatment group compared to the control groups. Three of the moderate duration interventions (60%) resulted in improved PA levels (McFadden et al., 2017; Wadsworth et al., 2010; Weinstock et al., 2016). Only two of the longer duration interventions (33%) reported significant improvements for the treatment group when compared to the control group (Annesi et al., 2017; Brown et al., 2014).

Eight of the included studies reported follow-up data ranging from 1-month (Brown et al., 2014; McFadden et al., 2017; Quintiliani et al., 2010), 2-months (Melton et al., 2016), 3-months (Sharp & Caperci, 2016; Ulla Diez et al., 2012), and 6-months (Mackey et al., 2015; Weinstock et al., 2016). Only five of the eight interventions reported sustained improvements in PA at follow-up (McFadden et al., 2017; Quintiliani et al., 2010; Sharp et al., 2016; Ulla Diez et al., 2012; Weinstock et al., 2016). Twelve studies reported intervention adherence (Brown et al., 2014; Mackey et al., 2015; McFadden et al., 2017; Melton et al., 2016; Pfeffer & Strobach, 2019; Quintiliani et al., 2010; Sharp et al., 2016; Topp et al., 2011; Ulla Diez et al., 2012; Wadsworth & Hallam, 2010; Weinstock et al., 2014; Weinstock et al., 2016). Intervention adherence refers to the degree to which participants completed the entirety of the intervention. The weighted average adherence across studies was 69.4%. The study with the fewest participants (n = 5) had the highest adherence (100%) and was a single-subject design (McFadden et al., 2017). The study with the lowest adherence (19%) was a 24-week RCT (Mackey et al., 2014).

Twelve out of the fourteen included studies used a theoretical framework to guide the research study. The studies used the social cognitive theory (n = 5), transtheoretical model of behavior change (n = 3), behaviorism (n = 2), self-determination theory (n = 1), self-regulation theory (n = 1), health action process approach (n = 1), and two studies did not use a theoretical framework. Overall, there was not a profound difference in PA outcomes between the theory-based and non-theory-based interventions.

The included studies employed a variety of cognitive and behavioral intervention strategies to encourage PA behavior. For example, nine of the studies used cognitive-behavioral techniques, such as journaling, counseling, motivational seminars, and motivational interviewing (Brown et al., 2014; McFadden et al., 2017; Pfeffer & Strobach, 2019; Rausse et al., 2018; Topp et al., 2011; Ulla Diez et al., 2012; Wadsworth & Hallam, 2010; Weinstock et al., 2014; Weinstock et al., 2016). Intervention adherence refers to the degree to which participants completed the entirety of the intervention. The weighted average adherence across studies was 69.4%. The study with the fewest participants (n = 5) had the highest adherence (100%) and was a single-subject design (McFadden et al., 2017). The study with the lowest adherence (19%) was a 24-week RCT (Mackey et al., 2014).

Assessment of Physical Activity

Most of the included studies collected PA data via self-report measures only (n = 9; Annesi et al., 2017; Brown et al., 2014; Pfeffer & Strobach, 2019; Quintiliani et al., 2010; Sharp et al., 2016; Topp et al., 2011; Ulla Diez et al., 2012; Wadsworth & Hallam, 2010). Five of the studies collected PA data through accelerometers and self-report measures (Mackey et al., 2014; McFadden et al., 2017; Melton et al., 2016; Weinstock et al., 2014; Weinstock et al., 2016). The remaining studies collected PA data through pedometers (n = 2, Myers et al., 2011; Topp et al., 2011). All of the self-report questionnaires had been validated previously, including the Stanford 7-Day Recall (n = 1, Pfeffer & Strobach, 2019), Godin Leisure-Time Questionnaire (n = 2, McFadden et al., 2017; Sharp et al., 2016), the International Physical Activity Questionnaire (n = 3, Brown et al., 2014; Topp et al., 2011; Wadsworth & Hallam, 2010), Compendium of Physical Activities (n = 2, Weinstock et al., 2014; Weinstock et al., 2016), Healthy Promoting Lifestyle Behavior-II (n = 1, Ulla Diez et al., 2012), and the US Behavioral Risk Factor Surveillance Survey (n = 1, Quintiliani et al., 2010). It is important to note that self-report PA data is not as accurate as direct report data. Future studies should aim to assess PA from direct and indirect measures. Future meta-analyses could compare the results of direct and indirect PA measures as well.

Research Design and Effectiveness

All of the fourteen studies implemented and assessed the effectiveness of a PA intervention with university undergraduate students. Nine of the 14 studies that met inclusion criteria were randomized control trials (Mackey et al., 2015; Melton et al., 2016; Pfeffer & Strobach, 2019; Quintiliani et al., 2010; Sharp et al., 2016; Ulla Diez et al., 2012; Wadsworth & Hallam, 2010; Weinstock et al., 2014; Weinstock et al., 2016). Five of the nine RCTs reported significant improvements in PA for the treatment group when compared to the control group (Pfeffer & Strobach, 2019; Ulla Diez et al., 2012; Wadsworth & Hallam, 2010; Weinstock et al., 2014; Quintiliani et al., 2010). Three of the three RCTs reported no significant difference between treatment and control groups (Melton et al., 2016; Sharp et al., 2016; Weinstock et al., 2016), while the remaining study reported low and unmeasurable PA across both groups (Mackey et al., 2014). Three studies were single-group design (McFadden et al., 2017; Myers et al., 2011; Topp et al., 2011). Two of the single-group design studies reported significant improvements in PA from baseline to post-intervention (McFadden et al., 2017; Topp et al., 2011). The remaining study was a two-group design without randomization (Brown et al., 2014). Participants in the intervention group reported significantly greater increases in PA when compared to the control group (Brown et al., 2014). Overall, 12 out of the 14 studies (85.71%) significantly improved PA behavior in college undergraduate students.
A number of research articles have highlighted a decline in PA participation among college students and show a relationship to various factors, including social independence, financial burdens, academic difficulties, novel peer influence, and boredom (Britt et al., 2017; Ruthig et al., 2011; Westgate & Wilson, 2018; Wilhite, Ashenhurst, Marino, & Fromme, 2017). The purpose of this review was, therefore, to systematically review the published research on the effect of PA interventions on PA behavior among college students. The findings from the 14 studies indicated an overall positive impact of PA interventions on PA behavior in undergraduate university students. The current review provided information about participant characteristics, intervention components, research design, and effectiveness to better inform future research.

Eleven of the 14 research studies were effective at improving PA in college students. Nine of the included studies were RCTs, which is the preferred design for PA intervention research (Rothwell, 2005). Five of the nine RCTs reported statistically significant improvements in PA for the treatment group when compared to the control group. This is consistent with previous reviews indicating a significant effect of RCTs on PA behavior with young adults (Murray et al., 2017) adults (Borek et al., 2018), and older adults (Shvedko et al., 2018). However, this was the first systematic review conducted with undergraduate students in the past ten years. Although the interventions included in this review revealed statistically significant results when comparing treatment to control, none of the studies used the exact same intervention or duration, which is needed to determine if the intervention alone is effective at improving PA behavior.

All 14 of the included studies reported gender information (74.79% female), but only seven of the 14 studies reported participant race (29.05% African-American, 45.58% White, 16.67% Hispanic). A lack of diversity for participant gender and race, as well as inconsistent reporting of such demographic information, is a limitation of the included studies. The high prevalence of female participants is consistent with previous PA reviews (Borek et al., 2018; Owen et al., 2017; Plotnikoff et al., 2015). With males typically reporting greater intrinsic motivation to engage in PA than females (Lauderdale et al., 2015; Wilson et al., 2019), it is necessary to tailor PA interventions to the motivation, desires, and needs of each gender. All of the studies included only two gender categories (i.e., male and female). It has been found that university students who identify as non-binary engage in less PA (Jones et al., 2017). PA interventions should provide adequate demographic options regarding gender and tailored programming to ensure safe and inclusive environments. Additionally, many of the studies that met the inclusion criteria for this study recruited homogeneous samples. It has been previously reported that White individuals report greater aerobic and strength training PA than Hispanic or African American individuals (Belcher et al., 2010; Wilson et al., 2019). Therefore, it is important to recruit college-student samples to determine differences in preference, enjoyment, engagement, and effectiveness of PA interventions.

The interventions that met inclusion criteria varied in duration from one to twenty-four weeks. Furthermore, each of the included interventions employed different cognitive or behavioral techniques to target PA behavior. It is necessary to explicitly describe intervention techniques in detail to enable valid and reliable evaluation of PA behavior change and adherence (Gourlan et al., 2016). This could help future researchers understand how certain intervention techniques may relate to intervention duration and adherence. It is important to note that intervention effectiveness in terms of increasing PA was greater in shorter interventions than longer interventions. This could have been due to intervention adherence as a product of the shorter interventions, or the effectiveness of the intervention strategies used in shorter interventions. However, future meta-analyses are needed to examine differences across intervention types in more depth. Given that university students are on semester schedules, it could be beneficial to use shorter interventions (i.e., 1 month), but repeat such interventions each season to improve adherence. PA intervention adherence (M = 76.47%) was much similar to a review of PA interventions with children (M = 89.5%, Howie & Staker, 2016), clinical adults (M = 73.7%, Vancampfort et al., 2016), and chronically ill adults (M = 77%, Bullard et al., 2019). It is necessary to evaluate tailored PA interventions on university campuses to determine both effectiveness and long-term adherence across different durations and demographic categories.

Twelve of the 14 included studies used a theoretical framework to guide the interventions. A meta-analysis found that interventions guided by a single-theory had a greater effect on PA than interventions guided by multiple theories (Gourlan et al., 2016). However, there were no significant differences in theory-based and non-theory-based interventions on PA behavior in this review. It is evident that further analysis is needed to determine whether theory-based interventions are actually more effective than interventions not guided by theory. Another review found that longer duration interventions and those with poor methodological rigor negatively impacted the effect of PA interventions across various time points as well as the fidelity of the interventions to the theory-based constructs. Overall, this review indicated the effectiveness of various interventions targeting PA behavior in college students. However, there were some limitations. Only 14 studies met the inclusion criteria for this study, and this is the only review within the past decade. Continued interventional research with university populations is needed to further understand such effects. The quality of the studies is another limitation. Each of the studies used a different research design, constructs, and duration. Furthermore, there was variability across each study regarding gender and race. Lastly, assessment of PA was a limitation in that self-report measures were used more frequently than direct measures of PA. Lastly, studies that were not published or were published in a language other than English were excluded, potentially excluding relevant findings.

**CONCLUSION**

Continued research specifically targeting university-student samples is necessary to determine differences in PA behavior across grade, gender, and race classification at the university level. Most research studies and reviews combine university-age samples with adult samples when implementing and evaluating PA interventions. However, university students are in a distinct life stage, and determining effective interventions across race, gender, and grade could increase PA adherence and improvements in mental, emotional, and social health. PA interventions with a larger sample size including historically black colleges and universities would provide a better representation of the effectiveness of interventions. Overall, PA interventions appear to be promising for improving PA behavior for undergraduate students. This systematic review indicates the necessity for university-specific PA interventions that measure long-term PA behavioral outcomes.
Table 2. Characteristics of Included Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample characteristics</th>
<th>Theoretical Framework</th>
<th>Intervention</th>
<th>Measurement of PA</th>
<th>Intervention Duration &amp; Adherence</th>
<th>PA Intervention Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pfeffer, I., &amp; Stroebach, T., 2019</td>
<td>N = 107 college students; ( M_{\text{age}} = 22.73 ) years, 67.29% female, 32.71% male</td>
<td>Health Action Process Approach (Schwarzer, 1992)</td>
<td>Tx group: 7-day PA planning diary/education. Control group: read scientific text for 15 mins</td>
<td>Stanford 7-Day PA Recall</td>
<td>Duration: 1 week Adherence: 95.69%</td>
<td>Intervention resulted in greater increase in PA for the treatment group compared to the control group.</td>
</tr>
<tr>
<td>McFadden, T., Fortier, M. S., &amp; Guérin, E., 2017</td>
<td>N = 5 female undergraduate students, ( M_{\text{age}} = 19.60 ) years, 100% female</td>
<td>Self-Determination Theory (Deci &amp; Ryan, 1985)</td>
<td>Participants received 90-minute physical activity counseling, weekly, for eight weeks.</td>
<td>Accelerometers, GLITEQ, PHQ for depression</td>
<td>Duration: 8 weeks Adherence: 100%</td>
<td>Large increases in PA and decreases in depression (based on Cohen’s D) for all 5 participants</td>
</tr>
<tr>
<td>Brown, D. M., Y. Bruy, S. R., Beatty, K. R., &amp; Kwon, M. Y. W., 2014</td>
<td>N = 174 undergraduate students, ( M_{\text{age}} = 17.97 ); 58% female, 42% male</td>
<td>Social Cognitive Theory (Bandura,1998)</td>
<td>Tx Group: HAL community with seminars for MI, CBT, and PA behavior change. Control Group: normal residence hall activities.</td>
<td>GPAQ 7-item Social Cognitive Theory PA measure</td>
<td>Duration: 20 weeks Adherence: 36%</td>
<td>HAL Tx group reported greater MVPA than the control group.</td>
</tr>
<tr>
<td>Wadsworth, D. D., &amp; Hallam, J. S., 2010</td>
<td>91 sedentary college females, 100% female 2-group RCT w/ pre/post</td>
<td>Social Cognitive Theory (Baron &amp; Kenny, 1986)</td>
<td>Tx group: 6 weekly PA emails, access to an e-counselor, and website. Control group: pre/post questionnaires only.</td>
<td>IPAQ Exercise SES</td>
<td>Duration: 6 weeks Adherence: 86.81%</td>
<td>Intervention group increased frequency of MVPA at 6 weeks, but not 6 months</td>
</tr>
<tr>
<td>Melton, B. F., Buman, M. P., Vogel, R. L., Harris, B. S., &amp; Bigham, L. E., 2016</td>
<td>N = 69 undergraduates, 100% female, ( M_{\text{age}} = 19.7 ) years, 100% African-American 2-group RCT</td>
<td>None</td>
<td>Tx Group: Jawbone UP platform w/ mobile application Control Group: MyFitness Pal self-monitoring</td>
<td>Actigraph Activity Step Count Monitor and Total Counts</td>
<td>Duration: 6-weeks Adherence: 72.5%</td>
<td>No significant difference in steps between the Tx and Control groups in African American females.</td>
</tr>
<tr>
<td>Ulla Díez, S. M., Fortis, A. P., &amp; Franco, S. F., 2012</td>
<td>N = 73 freshman Mexican students, 74% female, 26% male 2-group RCT</td>
<td>Social Learning Theory (Bandura &amp; Walters, 1977)</td>
<td>Tx group: 7-session (2.5 hours/session) behavior change program. Control group: nothing</td>
<td>Health Promoting Lifestyle Profile II</td>
<td>Duration: 9 days Adherence: 71.5%</td>
<td>Tx group reported greater PA, health responsibility, and stress management.</td>
</tr>
<tr>
<td>Weinstock, J., Capizzi, J., Weber, S. M., Pescatello, L. S., &amp; Petrty, N. M., 2014</td>
<td>N = 31 sedentary hazardous drinking students, ( M_{\text{age}} = 20.55 ) years; 35.35% male, 64.65% female; 90.25% White, 9.75% Other 2-group RCT</td>
<td>Contingency Management (Ritter &amp; Petry, 2006)</td>
<td>MET Group: 50-minute exercise planning session MET + Contingency Management Group: 50-minute exercise planning session and 8 weeks of CM.</td>
<td>Drinking behavior Accelerometer Time Line Follow Back via Compendium of Physical Activities</td>
<td>Duration: 8 weeks Adherence: 93.55%</td>
<td>The MET + CM condition showed an increased self-reported frequency of exercise in comparison to the MET alone condition. No significant group difference in accelerometer-based PA.</td>
</tr>
<tr>
<td>Mackey, E., Schuetzler, A., Hurtado, M. E., Hallaus, J., DiPietro, L., Lei, K. Y., &amp; Klein, C. J., 2015</td>
<td>N = 47 African-American college students; ( M_{\text{age}} = 19.2 ) years, 76% female, 24% male 2-group RCT</td>
<td>Social Cognitive Theory (Bandura,1998)</td>
<td>Tx group: online Alive! Nutrition and PA, goal-setting, SCT, and self-efficacy. Control group: access to website but no guided goal-setting.</td>
<td>Accelerometer</td>
<td>Duration: 24 weeks Adherence: 19%</td>
<td>Accelerometer adherence was low (30%), but PA and MVPA behavior was very low and couldn’t be compared between groups.</td>
</tr>
</tbody>
</table>
Table 2. Characteristics of Included Studies

<table>
<thead>
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<th>Study</th>
<th>Sample characteristics</th>
<th>Theoretical Framework</th>
<th>Intervention</th>
<th>Measurement of PA</th>
<th>Intervention Duration &amp; Adherence</th>
<th>PA Intervention Outcomes</th>
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</thead>
<tbody>
<tr>
<td>Weinstock, J., Petry, N., M., Pescatello, L. S., &amp; Henderson, C. E., 2016</td>
<td>N = 70; M_age = 20, 88.5% male, 11.5% female 2-group RCT</td>
<td>Contingency Management (Petry et al., 2011)</td>
<td>Group 1 received motivational interviewing plus weekly exercise contracting (MI + EC); Group 2 received motivational interviewing and weekly contingency management for exercise (MI + CM).</td>
<td>Timeline Follow Back via Compendium of Physical Activities</td>
<td>Duration: 8 weeks  Adherence: 94% at 2 months</td>
<td>Both groups increased PA frequency MI + CM exercised more than MI + EC Exercise frequency decreased at follow-up in both groups</td>
</tr>
<tr>
<td>Myers, D. L., Romero, Z., Anzaldua, N., &amp; Trinidad, M. L., 2011</td>
<td>N = 68 Hispanic undergraduate students, M_age = 22.43, 8% male, 92% female Single group, pre/post</td>
<td>Transtheoretical Model (Prochaska et al., 2002)</td>
<td>Participants wore pedometers for 9 weeks and self-reported weekly steps.</td>
<td>Pedometer Exercise Self-Efficacy</td>
<td>Duration: 9-weeks  Adherence: NA</td>
<td>Participants achieved 10,000 step threshold 7/8 weeks. Only two weeks were significantly greater than baseline.</td>
</tr>
<tr>
<td>Quintiliani, Campbell, Bowling, Steck, Haunes, &amp; DeVelis, 2010</td>
<td>N = 408 college students, 100% female, 81.3% White, 18.7% other 3-group RCT</td>
<td>Transtheoretical Model (Prochaska et al., 2002) &amp; Health Belief Model (Rosentock et al., 1988)</td>
<td>3 PA groups 1) received messages tailored to topic of choice, 2) received messages tailored to expert-tailored topic, 3) non-tailored messages.</td>
<td>US Behavioral Risk Factor Surveillance Survey; Stages of change, self-efficacy</td>
<td>Duration: 1 month  Adherence: 68.6%</td>
<td>Sig. increases in self-efficacy &amp; goal commitment at immediate follow-up and VPA at 1-month follow-up in expert-determined group compared to comparison group.</td>
</tr>
<tr>
<td>Annesi, Porter, Hill, &amp; Goldfine, 2017</td>
<td>N = 84, 69% female, 31% male 2-group design (non-RCT)</td>
<td>None</td>
<td>Tx Group: enrolled in university PA class at least 2x/week, Control group: not enrolled in PA</td>
<td>Self-report PA</td>
<td>Duration: 16 weeks  Attrition: NA</td>
<td>The Tx group reported sig. greater increase in PA when compared to Control group</td>
</tr>
<tr>
<td>Sharp, P., &amp; Capurchione, C., 2016</td>
<td>N = 184 first-year college students, M_age = 18 years; 65% White; 11% Chinese; 9% South Asian; 15% other; 53% male, 47% female 2-group RCT</td>
<td>Social Cognitive Theory (Bandura, 1998)</td>
<td>Tx Group: Wore pedometer, monthly PA logs, and monthly emails. Control Group: received no intervention but were promised a pedometer post-intervention.</td>
<td>HRQoL GLTEQ GHQ</td>
<td>Duration: 12 weeks  Adherence: 74.5%</td>
<td>Both Tx and Control groups experienced improvements in self-reported, moderate PA. No group differences for PA.</td>
</tr>
</tbody>
</table>

REFERENCES


Feng, Q., Qing-le Zhang, Y. D., Ye, Y. L., & He, Q. Q. (2014). Associations of physical activity, screen time with depression, anxiety and sleep quality among Chinese college freshmen. *PloS ONE*, 9(6), e100914. https://doi.org/10.1371/journal.pone.0100914


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ABSTRACT

The benefits of physical activity (PA) participation are well documented, and yet many students with disabilities remain inactive. Approximately 19% of U.S. undergraduate students have a disability and this is an 8% increase since a decade ago. As the number of college/university students with disabilities (CUSD) is consistently increasing, it is important to provide equal opportunities for this population to be physically active. While inactivity raises health concerns for all college students, literature reveals that CUSD are less physically active than those without disabilities and/or CUSD may not know much about college PA opportunities on campus. This suggests that there might not be enough college PA programs available for CUSD. The purpose of this paper is to provide the importance of PA programs/courses for CUSD, college/university students without disabilities, and faculty. In addition, we will identify possible challenges to designing and implementing college PA programs for CUSD and strategies to better manage those challenges based on a review of the existing literature.

Keywords: physical activity; college and university students with disabilities

INTRODUCTION

Benefits of Physical Activity

Evidence regarding the health benefits of physical activity (PA) has been well documented. For example, regular participation in PA can lower the risk for early death, and prevent several chronic diseases, such as cardiovascular disease, type 2 diabetes, cancer and obesity (Warburton et al., 2006). Despite recognition of the numerous benefits of PA, many people remain sedentary including college and university students. PA levels have decreased from high school to college and typically college and university students are less physically active compared to their childhood (Calestine et al., 2017; López-Valenciano et al., 2021). Due to inactivity, obesity is one of the growing concerns in this population. The American College Health Association (2019) reported that approximately 38% of college students reported being overweight (Body mass index at least 25 or higher). In addition, PA levels among university students were significantly reduced during the COVID-19 (López-Valenciano et al., 2021).

College and University Students with Disabilities (CUSD)

The number of students with disabilities pursuing higher education has been increasing over the years (Yoh et al., 2008). According to the National Center for Education Statistics [NCES] (2021), 19 percent of all undergraduates enrolled in the U.S. reported having a disability in 2015-2016, and this is an 8 percent increase since 2011-2012. Literature has shown that College and university students with disabilities (CUSD) are not meeting the recommended amount of PA and are less physically active than students without disabilities. For example, Úbeda-Colomer et al. (2019b) surveyed 1,103 university students with disabilities to examine whether they are achieving the World Health Organization (WHO) PA recommendation of at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity each week for adults. The study found that 72.2% of the study participants did not meet the recommendation of 75-minute activity, 80.3% of them did not meet the recommendation of 150-minute activity, and 63.1% did not meet any of these recommendations (Úbeda-Colomer et al., 2019b). In addition, another study done by Yoh et al. (2008) reported that the usage of and satisfaction with campus recreation facilities
among CUSD were significantly low. Yoh’s study found that 68% of college students with physical disabilities used less than 5 times per semester and approximately 37% of them have never used campus recreation facilities.

**Lack of Effort for PA Promotion Among CUSD**

While PA promotion for adults with disabilities is emphasized in the literature, CUSD are often overlooked and there is less attempt to promote PA opportunities for college students (Milroy et al., 2012). Low levels of PA of CUSD raise serious concern because the level of PA in higher education has significantly decreased post-graduation (Wilson et al., 2020). As mentioned previously, WHO recommends PA at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity each week for adults (“World Health Organization: Physical Activity.” 2020). In order to make CUSD meet the recommended amount of PA, providing more PA opportunities for CUSD on campuses are needed. Therefore, this paper is intended to address several areas in terms of the importance of PA programs/courses for CUSD.

Furthermore, discuss how college/university students without disabilities are also impacted and the benefits for faculty members. In addition, we will identify possible challenges and strategies to designing and implementing college PA programs for CUSD and further point out the lack of awareness of the programs available. Lastly, discuss the opportunities and accessibility along with the lack of motivation for participation in these PA programs.

**IMPORTANCE OF COLLEGE/UNIVERSITY PA PROGRAMS**

This systematic review protocol was prepared in accordance with the Preferred Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P) 2015 statement and was reported using the PRISMA statement as guidance (Moher, et al., 2015).

**Regulatory Compliance**

College PA programs for CUSD benefit the health of the campus community members and must adhere to certain laws and regulations. There are colleges that offer program classes for students with chronic conditions, disabilities, or limitations, such as Citrus College and West Valley College (“Citrus College DSPS EAC Q90 flyer,” 2022; “West Valley College,” 2022). Based on federal law of Americans with Disabilities, colleges must provide individuals with and without disabilities equal opportunity to participate in physical education and PA (National Association for Sport and Physical Education [NASPE], 2007). According to a position statement from the NASPE (2007), “all colleges and universities uphold a PA instructional program for students as a strong and integral part of the academic curriculum” (p. 1).

Similar to the United States, the United Kingdom has disability rights in regards to physical activity, such as the Special Education Needs and Disability Act (Haegele et al., 2017). Thus, providing college PA programs for students with disabilities is regulatory compliance.

**Benefits for CUSD**

Literature found that PA provides positive health effects for individuals with disabilities. For example, a systematic review done by Plotnikoff and colleagues (2015) found that PA interventions affect the improvement of health outcomes, such as PA and weight reduction for university students. In addition, Jo et al. (2018) found that muscle endurance in adults with intellectual disabilities (ID) significantly improved with a 12-week exercise program. PA also has positive effects on the psychological health of individuals with disabilities, such as improving self-efficacy in adults with ID, reducing depression in patients with a chronic illness, and improving problem-focused coping to reduce stress in university students (Herring et al., 2012; Jo et al., 2018; Kim & McKenzie, 2014). Besides several health benefits, there is evidence that PA participation contributes to improving brain function. A review done by Casebolt et al. (2017) reported that college/university PA programs could increase students’ PA and positively influence the academic success of college students. In their review (Casebolt et al., 2017), participation in PA contributes to improved brain function, such as learning, memory, concentration, attention, and information processing. As a result, these cognitive attributes are associated with improvement in academic success.

**Benefits for College/University Students without Disabilities**

University’s PA programs are courses or programs that are offer across the campus to promote physical activity for those who participate. This includes those with and without physical disabilities (Valis & Gonzalez, 2016). These programs offered for students with or without disabilities can also be use as service learning opportunities. Service learning is a pedagogical approach that connects discipline specific knowledge to practice through out-of-classroom activities (Bishop & Driver, 2007; Roper & Santiago, 2014, & Watson et al., 2002). Through service learning, students can connect with class curriculum, and they can develop leadership skills (Bishop & Driver, 2007, & Wurr & Hamilton, 2012). Research found that service learning has positively affect students’ attitudes toward people with disabilities. Lawson et al. (2016) found that college students who participated in community service involving direct contact with people with disabilities had positive attitudes toward them after the service learning experience.

**Benefits of PA Programs for Faculty**

Offering and developing adapted PA classes and programs for CUSD also provide benefits for faculty. One of the benefits for faculty is that it helps to promote learning for students (Bishop & Driver, 2007). Typically, faculty work alongside the students to run the PA programs by helping them to increase the level of understanding in the subject knowledge through hands-on experience for CUSD and increase student engagement in the classroom (Bishop & Driver, 2007; Chabot & Holben, 2003). Integrating PA as a component in a class can be beneficial for both faculty and students because it enhances subject knowledge and problem-solving abilities (Bishop & Driver, 2007). Another faculty benefit from PA programs is providing research opportunities by testing the effectiveness of the programs (Bishop & Driver,
2007). Consequently, working with students for these programs can contribute to improving student-faculty relationships (Bishop & Driver, 2007; Eyler et al., 2001). For instance, frequent interactions with students can provide opportunities for faculty to learn more about students and be able to guide and meet the needs of students with disabilities (Bishop & Driver, 2007).

STRATEGIES TO OVERCOME CHALLENGES

Constraint

There are several challenges when it comes to participation in PA programs. For example, recruiting people with disabilities to participate in PA programs can be a real difficult task. Recruiting individuals is not only a challenge for disability related studies but also one of the major difficulties for PA programs (Richard et al., 2015). Leisure constraints play a role in having difficulty in recruitment. There are three types of leisure constraints; it includes intrapersonal, interpersonal, and structural constraints (Allar & Taliaferro, 2014). These constraints have kept students from being able to participate in campus recreation activities. Intrapersonal constraints are defined as affecting an individual’s ability to participate in leisure activities and it can vary from person to person, especially those who rely on other people’s support. This may include personal trainers, friends, companions, or family members (Leung, Siebert, & Yun, 2017). On the other hand, structural constraints are inhibitors that keep one from being able to participate in leisure activities because of lack of access to transportation, facility’s access due to American Disabilities Act (ADA) compliance, and the cost of the program in itself (Piercey et al., 2018). Furthermore, Jehue et al. (1999) pointed out the factors that influence leisure participation by including their individual interest, the area where the facility is located, the proximity and accessibility of the facility, and those around the individual that encourage them to participate. In the case of university students, these leisure constraints prevent them from being able to actively participate in campus’ leisure recreation (Bult et al., 2011).

Lack of Awareness by CUSD

Based on the findings from previous literature, university student participants often were unaware of PA programs or facilities on campus. Hsu et al. (2021) found that nearly 70% of college students with disabilities reported that they used campus recreation facilities less than five times per semester and also nearly 40% of them have never used the facilities. This suggests a potential gap between awareness of opportunities and the existing programs on campus. A study done by Jaarsma et al. (2019) reported that students may not receive information about PA opportunities even if the school is advertising or distributing them. These findings suggest that practitioners should focus efforts to improve communication between the PA centers, the school, and CUSD. Jaarsma et al. (2019) suggests that improving communication about PA opportunities for people with disabilities can be achieved by providing more specific communication about PA programs, expanding communication networks, and using multiple methods to promote PA opportunities.

Lack of Opportunities & Accessibility

Although facility accessibility is legally mandated, the lack of opportunities and accessibility remains a major barrier to PA for people with disabilities (Mulligan & Nichols-Dunsmuir, 2017). Budget issues and time may limit opportunities to rebuild facilities (Rimmer et al., 2016). If this is the case, equipment modification and curriculum adjustments should be made so that the programs are inclusive and accessible for college students with disabilities (Úbeda-Colomer et al., 2019a). To make the adjustments, it is important to understand the unique characteristics of various disabilities to identify the needs of students in college PA programs (Úbeda-Colomer et al., 2019a). Activities should be modified, and curriculum should be adjusted to match students’ ability level (Úbeda-Colomer et al., 2019a; Choi, 2020). According to Choi et al. (2020), additional factors, such as positive attitude toward people with disabilities, collaborative support with instructors, peer-tutoring, and additional in-service learning training is essential for successful inclusion.

Moreover, financial constraints put all students including those with disabilities the opportunity to participate in sport and physical activity (Lee, & So, 2019). Lastly, a disadvantage for people with disabilities is to be able to access or participate in conventional sports activities due to the structure of team sport programs (Taub, Blinde, & Greer, 1999).

Lack of Motivation for Participants

Lack of motivation appears to be a consistent barrier to PA for people with disabilities (McDermott et al., 2022). In order to address this issue, PA preferences should be considered when planning, developing, and implementing college PA programs for students with disabilities. In addition to preferred types of PA, other factors related to PA participation should be considered, including the setting (facilities on campus vs somewhere else) and format (group vs. individual). Roman et al. (2013) reported that enjoyment in school-based PA programs is associated with high levels of PA participation. These results suggest program participation of college PA programs for students with disabilities depends on the perception of the PA as enjoyable. Other ways to increase enjoyment of the college PA programs for students with disabilities include reducing competitive activities and value participation rather than performance. Practitioners should emphasize the importance of PA with CUSD with PA-related workshops or other campus events.

Furthermore, college students are faced with social challenges going from high school to college. This is evident in academic performance especially those who are adjusting to college life. This ultimately creates a lack of motivation to participate in campus activities, let alone physical activities. Casebolt et al. (2017)’s research indicated that college students find it most difficult in their first semester and those who are failing tend to lack the motivation to participate in campus activities. This can lead to stress and prohibit from being able to participate in leisure activities and campus recreation activities (Devine, 2016). In addition, Pans et al. (2021) pointed out that first year college students drop out within the first semester because they are faced with many challenges and difficulty in adapting to the university environment. Therefore, stress is considered a major constraint to campus recreation participation among students with disabilities.
IMPLICATIONS AND RECOMMENDATIONS

The importance of PA for people with disabilities and promoting PA for CUSD cannot be understated. There is also limited research on PA for CUSD that includes the lack of accessibility to the PA facilities and lack of effort to develop such programs/courses. As a result, CUSD are less active and often do not engage in their schools’ PA and recreational facilities. Based on the literature, there is much need for providing PA programs for students at colleges and universities. Campuses should address this issue by looking at what the needs area for students with disabilities beyond PA programs but other supportive programs to meet their needs. For example, Liu and Jung (2016) found that Physical Education programs offered by the university have influenced students’ motivation to participate in exercises outside of the classroom. Moreover, Ntoumanis (2001) found that having supportive programs has resulted in benefiting the student body including those with disabilities. Furthermore, this would provide an opportunity to elicit future research to be done due to lack of current literature. There is a lack of PA courses and programs for CUSD, little effort has been made to develop programs/courses. Not only lack of opportunities due to barriers and accessibility, but also other issues, such as motivation, lack of communication could be possible factors for this concern. Moreover, very little effort has been made to develop the effectiveness of the current program in PA on campus. As a result, awareness brings inclusive programs availability and lack of PA courses for people with disabilities. For example, recreation center currently does not have a PA program and campus administrators fails to offer PA programs in their universities. Based on the literature, there is much need in offering PA programs for people with disabilities. Campuses should address this issue by looking at what the needs are for students with disabilities beyond PA programs along with providing other supportive programs to meet their needs.

SUMMARY

The number of CUSD is increasing and the PA participation of this population is well below recommended PA levels. Inactivity habits remain or increase for this population with age. Under the federal mandate of Americans with Disabilities Act, CUSD should be given more PA opportunities. Literature suggests that promoting PA in colleges and universities are important for students since it leads to positive outcomes. PA programs/courses are not only beneficial for their health, but also can have a positive contribution to their academic performance. College and university students without disabilities can gain benefits such as deeper understanding of adapted PA related course materials, building leadership skills, and improving attitudes towards people with disabilities. Furthermore, leisure constraints such as intrapersonal, interpersonal, and structural have limited students’ participation in campus recreation. In addition, communication in regard to PA opportunities for people with disabilities on campus has been lacking. The need to expand communication networks and promote PA opportunities must be in place. Moreover, accessibility must be made available with equipment modification and curriculum adjustments so that programs are inclusive and accessible for all college students including those with disabilities. Lastly, creating a motivation environment that reduces competitive activities and value participation rather than performance should be addressed.

REFERENCES


ORIGINAL RESEARCH

A Case Study Applying Lag-Sequential Analysis on Manchester City’s End of Offensive Phase During the UEFA Champions League

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“In loving dedication to my two daughters, Emily and Leah Rose”

ABSTRACT

End of offensive phase with efficacy is the main aim in soccer. Limited research on Guardiola’s Manchester City, catalysed this diachronic, idiographic, and multidimensional case study which applied lag-sequential analysis. All attacking behaviours of City’s matches from the UEFA Champions League 2019-2020 (group stage) were obtained from INSTAT, recorded on SoccerEye and analysed by SDIS-GSEQ and Microsoft Excel. Findings show that City had a 17.07% efficacy in their attacking sequences. Having the ball in the central offensive zone induced wide shots (Fws z=4.14), shots on target (Fst z=2.34) and goals (Fgl z=4.61), and inhibited loss of ball possession by error of the ball carrier / defender’s intervention (Fled z=-7.74). City’s relative numerical inferiority induced loss of ball possession by error of the ball carrier / defender’s intervention (Fled z=2.49) or loss of ball possession by intervention of the opponent’s goalkeeper (Fgk z=2.52), while numerical equality with no pressure induced wide shots (Fws z=3.77) and throwing the ball out of the pitch (Fo z=2.51). The interactions between forward line and opponents’ midline (FM; z=2.66) and midline with midline (MM; z=4.18), induced loss of ball possession by error of the ball carrier / defender’s intervention. Finally, it was evident that City’s goals (Fgl z=4.63) were induced by the ball being played between the offensive line of the attacking team and the empty zone (opponent goalkeeper) of the defending team. Besides contributing to the existing gap of scientific understanding of patterns of play in Manchester City’s game, these findings shall also provide a benchmark for comparisons in future research and also a scientific foundation to discuss football match analysis.

Keywords: soccer; offensive phase; sequential analysis; case study; Manchester city

INTRODUCTION

The end of offensive phase with efficacy (Barreira, Garganta, & Anguera, 2013; Barreira, Garganta, Castellano, et al., 2013b), more specifically goal scoring, is the ultimate determinant of successful performance in soccer (Kubayi, 2020). This study conceives the end of offensive phase in the idea of football as a complex system (Gréhaigne et al., 1997), characterised by complex interrelationships between players and context (Barreira, Garganta, Castellano, et al., 2013a). At minimum, the success of an attack can be obtained if, and when, space and players choices are taken into consideration (Gréhaigne et al., 1997). For these reasons, rather than considering the players’ actions disjointedly this study focuses on the complexity of the game (Sarmento et al., 2010), by looking beyond numbers and percentages, but by applying a spatio-temporal perspective to match analysis.

Purpose

Pep Guardiola is publicly renowned for the way he tactically organises his teams’ tactical approach in the offensive phase (ex. Buldú et al., 2019; Segrave et al., 2018). The specific use of each department within the team, including the use of full backs more central in midfield, and the dynamic functionality of the offensive players, are a cornerstone for the attacking style in Guardiola’s teams (Segrave et al., 2018). Reflecting “the emphasis put on possession by Guardiola’s side”, and reflecting the importance for his team to patiently look for gaps without losing the ball, in 2021, Guardiola’s Manchester City was the team with the highest percentage (41.6%) of passes backwards (CIES
The importance the coach puts on the offensive phase of his team, raises interest in looking deeper at the way this specific style of play in attack leads to the end of the offensive phase.

While goal scoring and goal scoring opportunities have been given substantial attention in literature (Buldú et al., 2019; Kubayi, 2020; Mitrotasios & Armatas, 2012), there is limited literature that focuses on Pep Guardiola’s teams. In fact a thorough and systematic search for literature on Pep Guardiola’s teams, led to only 6 publications (Buldú et al., 2019; Casals, 2011; Melo & Galatti, 2018; H. Sarmento et al., 2011; Hugo Sarmento et al., 2016; Segrave et al., 2018), with no quantitative and only one qualitative study, focusing on Manchester City, and with the remaining publications focusing on previous teams Guardiola was coaching.

In light of this vacuum, this case study explores the regular patterns of play (Barreira, Garganta, Castellano, et al., 2013a; Barreira, Garganta, Guimarães, et al., 2014) during the end of offensive phase of Manchester City during the group stage of the UEFA Champions League 2019-2020. Further engagement in scientific analysis of individual coaches’ and teams’ style and system of play like the ones explored here, may contribute to the generation of what is yet a limited field of research. Furthermore, it may contribute to pushing the field of match analysis practice and research, towards one which recognizes football as a complex and dynamic system made of interactions. This can be done by taking a systemic approach to match analysis (Clemente et al., 2015), which considers the “interactions between the main variables of the different components of systems and sub-systems” of the game (Gréhaigne et al., 1997, p. 1).

**Literature**

In this review it was pertinent to present academic positivist approaches that have been used to present Pep Guardiola’s game. Coincidently all studies focusing on FC Barcelona.

Through eigenvector centrality, a measure of importance in the network structure, it was possible to confirm that the two central attacking midfielders in Guardiola’s FC Barcelona (2009-2010), Xavi and Iniesta were central in the patterns of play administered by the team (Buldú et al., 2019). The authors demonstrate how on average, when compared to their opponents, FCB outdid their opponents in number of points at the end of the season, had more than double the number of passes and goals and almost double the shots of their opponents. These findings have been sustained by a study on all Pep’s 88 games in the UEFA Champions League between 2008 and 2016, which study found that when compared to other teams, Pep’s team had more ball possession, shooting and goals (Melo & Galatti, 2018).

Buldú et al., (2019) confirmed that Barcelona used to play closer to the opponents’ goal. The area covered by the initial position of the passing players, was slightly wider than their opponents’ position, indicating that Barcelona use width slightly more than their opponents, and Barcelona used to pass the ball more parallel to the opponent’s goal, hence less vertical (direct) than their opponents. Furthermore, the researchers showed that the connections between ‘three players triangles’ happens more with Barcelona than with their rivals and that the average shortest path of Barcelona was much lower, hence their players used to be closer to each other than their opponents. Guardiola’s Barcelona had a higher robustness of the passing network, with a loss of passes resulting in a lower consequence than the rest of the teams. Buldú et al., (2019, p. 4) also demonstrated “that FCB attacking and defensive lines are more intermingled” than their opponents’ and hence they are less “close to be split into two groups”.

The researchers also discovered an interesting pattern that deserves mention in this study. They identified what they call the ‘cooperation zone’ and the ‘helping zone’. In the helping zone, there would be a player with the ball, and another two players offering support, “forming possible triangles with a distance of 10 to 15 meters” (p. 9). Outside that circle, with a distance of around 20 meters there would be another 2 players in the co-operation area. One of the players would be slightly forward and the other player covering the back.

In a sequential analysis on F.C. Barcelona (FCB) counterattacking in the same season (2009-2010), Sarmento et al. (2016) outlined that; (a) the start of the offensive process by regular interruption induced the use of offensive midfield zones; (b) the long pass induced behaviours related to the continuity of the offensive process; and (c) a cross from the left offensive sector induced a goal.

Delving deeper in the pattern of play of the same team during the same season, Sarmento et al. (2011) came to additional conclusions, namely that the recovery of the ball by disarming is followed by a dribble (z=2.24). The recovery of the ball by intervention of goalkeeper, there is a tendency that the sequence keeps going by the right side of the pitch, in a controlled manner with the inclusion of dribble (z=2.47) and conduction of the ball (z=2.71). Furthermore, they add to say that shots with goal were induced by dribble (z=3.32), crossing (z=2.82) and intervention of opponent without efficacy (z=3.32).

With the limited academic work published on Pep Guardiola’s teams, and with the vacuum of academic work existing on Manchester City, this study presents a deep analysis of the End of the Offensive Phase of Manchester City under the guidance of Pep Guardiola, during the UEFA Champions league 2019-2020.

**METHODS**

**Design**

The End of the Offensive Phase is a behaviour that “causes the loss of ball possession of the observed team” either ‘with efficacy’ or ‘without efficacy’. A team’s offensive phase can be ended with efficacy through a “wide shot” (Fws), a ‘shot on target’ (Fst), a ‘shot stopped, with no maintenance of ball possession’ (Fso) and ‘goal’ (Fg). While ‘loss of ball possession by error of the ball carrier / defender’s intervention (except to the goalkeeper)’ (Fled), ‘loss of ball possession by the intervention of the opponent’s goalkeeper’ (Fgk), ‘throwing the ball out of the pitch’ (Fo) and ‘violation of the laws of the game’ (Fv) contribute to the end the offensive phase with no efficacy (Barreira, Garganta, & Anguera, 2013, p. 10).

This diachronic, follow-up, idiographic and multidimensional (Barreira, Garganta, Guimarães, et al., 2014; Barreira, Garganta, Machado, et al., 2014; Machado et al., 2011) study has applied observational methodology (Camerino et al., 2012), with specific reference to lag-sequential analysis (Barreira et al., 2015; Barreira, Garganta, Guimarães, et al., 2014; Decroos et al., 2018; H. Sarmento et al., 2011). This is a method of analysis which considers time as a central factor and which makes it possible to conceptualize “social interaction
More specifically through lag-sequential analysis, this study looks into answering the following sub research questions:

- How were Patterns of Pitch Space Position (Zones) associated with the End of the Offensive Phase with Efficacy?
- What were Patterns of Pitch Space Position (Zones) associated with the End of the Offensive Phase with No Efficacy?
- How was Centre of the Game (Numerical Inequality, Numerical Equality, Numerical Superiority) associated to the End of the Offensive Phase?
- How were Spatial patterns of Team Interactions associated with the End of the Offensive Phase?
- How was the Start of the Offensive Phase associated with the End of the Offensive Phase?
- How was the Centre of the Game (Numerical Inequality, Numerical Equality, Numerical Superiority) associated with Patterns of Pitch Space Position (Zones).

To obtain understanding of this phenomenon, 417 attacks made of a total of 8277 events (events make one whole offensive action and are categorised in (i) Start of offensive phase/ball recovery, (ii) Development of defence/attack transition-state; (iii) Progress of ball possession; (iv) End of offensive phase; (v) Pattern of pitch space position; (vi) centre of game; (vii) Spatial pattern of interaction between teams, coming from six matches Manchester City played in the group stage of the UEFA Champions League 2019-2020 (Table 1) were recorded.

<table>
<thead>
<tr>
<th>Game</th>
<th>Result</th>
<th>Attacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shakhtar vs City</td>
<td>0–3</td>
<td>64</td>
</tr>
<tr>
<td>City vs Dinamo</td>
<td>2–0</td>
<td>79</td>
</tr>
<tr>
<td>City vs Atalanta</td>
<td>5–1</td>
<td>61</td>
</tr>
<tr>
<td>Atalanta vs City</td>
<td>1–1</td>
<td>68</td>
</tr>
<tr>
<td>City vs Shakhtar</td>
<td>1–1</td>
<td>77</td>
</tr>
<tr>
<td>Dinamo vs City</td>
<td>1–4</td>
<td>68</td>
</tr>
</tbody>
</table>

Table 1. Games, Results and Number of Attacks and Events Observed

**Tools for Data Collection and Analysis**

Training of how to use the software was assisted with a thorough application of “Soccer Eye Observational Instrument of the offensive phase in Soccer” official manual before official data was collected. Following a pilot process of data collection applied by the researcher, it became evident that it was necessary to clarify certain matters about how specific moments during the game were interpreted, and hence which event (button on Soccer Eye) needed to be marked in such instances. The necessary clarifications were also obtained through a set of discussions with Dr Barreira from Universidade Do Porto (Barreira, Garganta, & Anguera, 2013).

Recordings of the matches were downloaded from InStat (Kubayi, 2020). Based on the SoccerEye Observational Instrument (Barreira, Garganta, Castellano, et al., 2013b), the SoccerEye recording software was used to record every event (8277) that happened in the 417 attacks. The match status, competition stage and all the events were recorded (Barreira, Garganta, Machado, et al., 2014). The ‘restrict recording’ feature in The SoccerEye v3.2 Observational and Recording Software Interface (Barreira, Garganta, & Anguera, 2013, p. 15) was also used. The use of SoccerEye has assisted in reducing time spent in the observational process and hence in the reduction of errors when that is compared with the hand notation system (Machado et al., 2011). Furthermore, during data entry, footage was re-played as many times as necessary to make identification of analysis criteria easier to record and to ensure that coding was done in a reliable manner (Bakeman & Quera, 2001).

The Sequential Data Interchange Standard-Generalized Sequential Querier (SDIS-GSEQ) version 5.1.23 (Bakeman & Quera, 2001; Barreira, Garganta, Guimarães, et al., 2014) was used to run the Cohen’s Kappa index to obtain the intra-rater reliability and to statistically analyse the patterns of play indicated by the data. The results generated in the SDIS-GSEQ were exported into the Microsoft Excel...
Reliability

Like Sarmento et al. (2010), this study looked at the stability of observation through an intra-observer agreement, obtained through the kappa reliability test. The second (15th to 30th minute of the game) and the fourth fifteen minutes (45th to 60th minute of the game) of Manchester City Vs Shakhtar, and Dinamo Vs Manchester City have been re-assessed respectively. The new set of data emerging from this re-assessment was compared to the original data obtained in the first process of assessment. That made it possible to run the kappa reliability test. That accounts for a sample size of 5.5% of the total observed match time (30 minutes from a total of 540 minutes). This second coding process was done two weeks after all the main data was coded. Reliability was evaluated by the function “compute Kappa” of the SDIS-GSEQ (Bakeman & Quera, 2001). Kappa coefficient was calculated for each of the seven criteria and for all the criteria all together (Casal et al., 2019).

The interpretation of Cohen’s Kappa (Casal et al., 2019) was used as reference (Table 2). While a weak Kappa of 0.48 was obtained when considering all categories’ data together, this study was possible through the analysis of Start of the Offensive Phase (B, 1.00), End of the Offensive Phase (F, 0.82), Patterns of Pitch Space Position (zones, 0.76) and Spatial Patterns of Teams’ Interactions (0.64), which were considered to be almost perfect, strong and moderate (McHugh, 2012), respectively (Table 3).

<table>
<thead>
<tr>
<th>Value of Kappa</th>
<th>Level of Agreement</th>
<th>% of Data that are Reliable</th>
</tr>
</thead>
<tbody>
<tr>
<td>.00 - .20</td>
<td>None</td>
<td>0–4%</td>
</tr>
<tr>
<td>.21 - .39</td>
<td>Minimal</td>
<td>4–15 %</td>
</tr>
<tr>
<td>.40 - .59</td>
<td>Weak</td>
<td>15–35%</td>
</tr>
<tr>
<td>.60 - .79</td>
<td>Moderate</td>
<td>35–63%</td>
</tr>
<tr>
<td>.80 - .90</td>
<td>Strong</td>
<td>64–81%</td>
</tr>
<tr>
<td>Above .90</td>
<td>Almost Perfect</td>
<td>82–100%</td>
</tr>
</tbody>
</table>

Table 3. Results of All Categories from Kappa in the SDIS-GSEQ

<table>
<thead>
<tr>
<th>Category</th>
<th>Kappa</th>
<th>Agreement</th>
<th>Maximum Value of Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of the Offensive Phase (B)</td>
<td>1.00</td>
<td>100%</td>
<td>1.00</td>
</tr>
<tr>
<td>Patterns of pitch space position (zones)</td>
<td>0.76</td>
<td>81%</td>
<td>0.98</td>
</tr>
<tr>
<td>Spatial patterns of teams’ interactions</td>
<td>0.64</td>
<td>77%</td>
<td>0.94</td>
</tr>
<tr>
<td>End of the offensive phase (F)</td>
<td>0.82</td>
<td>99%</td>
<td>0.87</td>
</tr>
<tr>
<td>All categories together</td>
<td>0.48</td>
<td>59%</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Statistical Analysis

This study investigated the association between each type of category to understand if there were any associations within the attacking pattern of play of Manchester City in the group stage of the UEFA Champions League 2019-2020. The data was analysed through lag sequential analysis (Bakeman & Quera, 2001) in SDIS-GSEQ. This made it possible to “…determine the probability of there being significant association between different match events” (Barreira, Garganta, Machado, et al., 2014, p. 39). As shown in Table 1, this study includes 8277, which are mainly the smaller components of the 417 attacking actions analysed. Statistical significance was set at p≤0.05 and z≥1.96 (Bakeman & Quera, 2001; Sarmento et al., 2016). When necessary, a prospective or retrospective perspective of plus or minus five lags following or preceding the primary event was applied to determine the subsequent pattern(s) of attacking play (Bakeman & Gottman, 1989; Sarmento et al., 2016).

RESULTS

Manchester City scored 16 goals from 410 attacks. The 3.9% of City’s attacks ending up in a goal is a very high return when compared to the average of 1% of attacks per game ending in a goal during the 1990 World Cup (Dufour, 1993). From the 410 observed attacks, 70 (17.07%) ended with efficacy (Figure 1).

End of the Offensive Phase with Efficacy Associated to Pitch Space Position.

The end of offensive phase with efficacy (Figure 2A), showed statistical significance with ‘wide shot’ ($F_{ws} z=4.14$), ‘shots on target’ ($F_{st} z=2.34$) and ‘goal’ ($F_{gl} z=4.61$) from zone 11. One may argue that this significance between end of offensive phase with efficacy and zone 11, is highly related to a style of play that has been observed by teams such as the Spanish national team that won the European Championship and the World cup and FC Barcelona in the years of Guardiola. While Manchester City is neither applying that style of play
nor the same principles applied by the Spanish teams, still, their efficiency in that same zone is significant, and hence one may argue that City have adopted attributes which are similar to the mentioned teams. As discussed by Athanasios (2011), Barcelona could obtain this style of play by creating superiority in numbers in the moment build up was taking place on the flanks. This superiority was obtained by Alves’ forward runs, and his collaborations with Pedro, Xavi and Messi. On the left, this was done with the runs of Abidal or Maxwell/Adriano who combined with Villa and Iniesta. At City, these players were replaced by the likes of Walker, Cancelo, Mahrez and Bernardo Silva on the right, and with Mendy, Sterling and David Silva on the left. The idea of the full backs, mostly Walker, being very offensive in their approach has also been sustained by literature (Segrave et al., 2018, p. 7).

### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fws</td>
<td>Wide shot</td>
</tr>
<tr>
<td>Fst</td>
<td>Shot on target</td>
</tr>
<tr>
<td>Fso</td>
<td>Shot stopped with no maintenance of ball possession</td>
</tr>
<tr>
<td>Fgl</td>
<td>Goal</td>
</tr>
<tr>
<td>Fled</td>
<td>Loss of ball possession by error of the ball carrier/defender’s intervention, except to goalkeeper (GK)</td>
</tr>
<tr>
<td>Fgk</td>
<td>Loss of ball possession by the intervention of the opponent’s goalkeeper</td>
</tr>
<tr>
<td>Fo</td>
<td>Throwing the ball out of the pitch</td>
</tr>
<tr>
<td>Fi</td>
<td>Violation of the laws of the game</td>
</tr>
</tbody>
</table>

**Figure 1. Total Frequency of All the 8 Categories of the End of Offensive Phase.**

**End of the Offensive Phase with No Efficacy Associated to Pitch Space Position.**

To give context to Manchester City’s 89% passing accuracy and 21% passing inaccuracy reported in the UEFA Champions League. Technical report 2019/20 (2020), one can look at the ends of offensive phase with no efficacy (Figure 2B), which were mainly associated to ‘loss of ball possession by error of the ball carrier/defender’s intervention (except to the goalkeeper)’ (FLED) in zones 5 ($z=2.66$) and 8 ($z=6.41$), and to ‘throwing the ball out of the pitch’ from zone 9, which is mainly the side of Cancelo, Walker, Mahrez and Bernardo Silva.

While, as expected, there also was a very strong association between zone 11 and ‘loss of ball possession by the intervention of the opponent’s goalkeeper’ (Fgk, $z=7.32$), it became very intriguing to notice that there is a negative association between this zone 11 and Fled ($z=-7.74$; $p<.01$). While Zone 11 is normally perceived as being very crowded, and hence an area where the ball can easily be lost, findings clearly show that it was not the case with Manchester City. This negative association, together with the association of end of the offensive phase with efficacy reported earlier (Figure 2A), could be the result of various aspects of their tactical game. First, one needs to identify the great efficacy the front five players possess (Segrave et al., 2018, p. 13). Secondly, one needs to underline that one of the tactical purposes of Manchester City’s fast distribution around the opponent’s back, is exactly to attract opposition out of position and create these half spaces for attacking midfielders who then run into half spaces, (Lucchesi, 2017; Mansueto, 2017) very often unnoticed, and hence with less chance to lose the ball. Finally, City are renowned for their ‘patience’ (Athanasios, 2011, p. 30), and for their ability to pass the ball back (CIES Football Observatory, 2021) even when they are so close to goal, if and when spaces are not available.

**Figure 2. Sequential Data of the End of Offensive Phase with Efficacy (A) and with No Efficacy (B).**
The Association of End of the Offensive Phase to Centre of the Game

End of the offensive phase with no efficacy was obtained through an association of ‘numerical equality with no pressure’ and ‘throwing the ball out of the pitch’ (Fo 14; z=2.51; p=0.01). The association of the end of the offensive phase with either Relative Numerical Inequality or Numerical Equality with No Pressure was found to be statistically significant (Table 4). When they were in a ‘relative numerical inferiority’, Manchester City ‘lost ball possession by error of the ball carrier / defender’s intervention (exception to the goalkeeper)’ (Fled 119; z=2.49; p=0.01); and lost ball possession by the intervention of the opponents’ goalkeeper (Fgk 26 (z=2.52; p~.01) as already said, in Zone 11 (Fgk, z=7.32). Both associations indicated end of the offensive phase with no efficacy. This statistical significance found in City’s losing the ball in Zone 11 with either Relative Numerical Inequality or Numerical Equality highlights how Manchester City’s possession patiently attracts opponents out, for them to then penetrate the created spaces through the tactical mobility in the final phase. This puts them in a position where although they lose the ball, they do so in relative numerical inferiority or numerical equality in a zone where one is expected to be in absolute numerical inferiority. When, on the other hand, City managed to tactically obtain ‘numerical equality with no pressure, they induced end of the offensive phase with efficacy, as there was a strong association with ‘wide shot’ (Fws 13; z=3.77; p<0.01).

Table 4. Results of End of the Offensive Phase in Association with Centre of the Game (Barreira et.al., 2013)

<table>
<thead>
<tr>
<th>End of the Offensive Phase with Efficacy</th>
<th>End of the Offensive Phase with No Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Numerical Inequality (Pr):</td>
<td></td>
</tr>
<tr>
<td>“The observed team has one or two influent players less than the opponent in the center of the game.”</td>
<td></td>
</tr>
<tr>
<td>Examples: 1x2, 2x4, 3x4, 3x5</td>
<td></td>
</tr>
<tr>
<td>Fled 119 (z=2.49; p=0.01)</td>
<td></td>
</tr>
<tr>
<td>Fgk 26 (z=2.52; p~.01)</td>
<td></td>
</tr>
<tr>
<td>Numerical Equality with No Pressure (NPe):</td>
<td></td>
</tr>
<tr>
<td>“The observed team has the same number of players than the opponent in the center of the game. The ball carrier (Jap) has his chest oriented to the opponent’s goal, with conditions to progress into the pitch offensive zones.”</td>
<td></td>
</tr>
<tr>
<td>Example: 1x1, 3x3, 4x4</td>
<td></td>
</tr>
<tr>
<td>Fws 13 (z=3.77; p&lt;0.01)</td>
<td>Fo 14 (z=2.51; p=0.01)</td>
</tr>
</tbody>
</table>

The Association of End of the Offensive Phase to Spatial Patterns of Teams’ Interaction

There were four associations between the end of the offensive phase (with no efficacy) and spatial patterns of team’s interactions that were statistically significant. As shown in Table 5, there were 15 ‘lost ball possession by error of the ball carrier / defender’s intervention (exception to the goalkeeper)’ in an ‘FM’ interaction (z=2.66), and 87 in an ‘MM’ interaction (z=4.18), 11 Fo in an ‘EB’ interaction (z=4.44) and 33 Fgk in an ‘FE’ interaction (z=14.81). This might interestingly indicate how Manchester City rarely lose the ball without their defence being well set. This might draw an important attention to Guardiola’s work on preventive marking, which is not so often discussed.

Table 5. Results of End of the Offensive Phase in Association with Centre of the Game (Barreira et.al., 2013)

<table>
<thead>
<tr>
<th>End of the Offensive Phase with Efficacy</th>
<th>End of the Offensive Phase with No Efficacy</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM: “The ball is played between the offensive line of the attacking team and the midline of the defending team”.</td>
<td></td>
</tr>
<tr>
<td>Fled 15 (z=2.66; p~.01)</td>
<td></td>
</tr>
<tr>
<td>MM: “The ball is played between both teams’ mid lines”.</td>
<td></td>
</tr>
<tr>
<td>Fled 87 (z=4.18; p&lt;.01)</td>
<td></td>
</tr>
<tr>
<td>EB: “The ball is played between the exterior zone of the offensive line of the attacking team and back line of the defending team”.</td>
<td></td>
</tr>
<tr>
<td>Fo 11 (z=4.44; p~&lt;.01)</td>
<td></td>
</tr>
<tr>
<td>FE: “The ball is played between the offensive line of the attacking team and the empty zone (opponent goalkeeper) of the defending team”</td>
<td></td>
</tr>
<tr>
<td>Fgl 8 (z=4.63; p&lt;.01)</td>
<td>Fgk 33 (z=14.81; p&lt;.01)</td>
</tr>
</tbody>
</table>
With 16 goals in 6 matches, Manchester City had an average of 4 goals per match, when compared to the overall 3.24 goals per match happening in the Champions League 2019-2020 (UEFA Champions League, Technical report 2019/20, 2020). Out of these 16 goals, 8 were part of an important interaction that led to end of the offensive phase with efficacy with a strong statistical significance. All those 8 goals (50%; Fgl = 4.63) happened in an ‘FE’ interaction. This meant that there is a significant pattern in the way Manchester City get to a goal. This not only sustains the mobility that has been discussed earlier. This also supports the analysis by Segrave et al. (2018) which outlines both the importance of clinical strikers, but also of the same strikers evacuating their familiar zones to create spaces for their teammates and find goal scoring opportunities by getting the ball in the offensive line in “the empty zone” (Barreira, Garganta, Castellano, et al., 2013a, p17-22). This is factually supported by the 6 goals scored by the strikers with the remaining 10 scored by another 5 players (Segrave et al., 2018; UEFA.com, 2020).

The Association of ‘The Centre of the Game’ with ‘Patterns of Pitch Space Position’

Guardiola’s game philosophy of overloading one side of the pitch to attack from the other side (Segrave et al., 2018, pp. 6–7) made it very appealing to try to understand what is the association that exists between the ‘patterns of pitch space position’ and ‘centre of the game’ (Barreira et al., 2012).

The negative associations of ‘the Centre of the Game’ to the ‘Patterns of pitch space position’ (zones) were analysed. Results in figure 5 show that zones 1 to 7 and zone 9 inhibited relative numerical inferiority (Pr), zones 1 to 5 inhibited numerical equality with no pressure (NP), while zone 5 inhibited situations with absolute numerical inferiority (Pa) or numerical quality with pressure (Pe).

“Modern elite teams [have] more difficulties to create favourable numerical contexts” (Barreira et al., 2015, p. 59), in high areas of the pitch. In line with this, this study shows that closer to the opponents’ goal (zones 7, 8, 9, 10, 11 and 12), relative numerical superiority (NP) and absolute numerical superiority (PA) were inhibited. Furthermore, absolute (Pa) and relative (Pr) numerical inferiority, were only statistically significant in zones 8 (Pr z = 6.26, n = 483), zone 12 (Pr z = 3.17, n = 59; Pa z = 2.41, n = 4), and as expected in zone 11.

The Association of ‘The End of the Offensive Phase’ with ‘Start of the Offensive Phase’

End of offensive phase was induced by ball recovery situations but inhibited by ‘lost ball possession by error of the ball carrier / defender’s intervention (exception to the goalkeeper) (Fled). Differently from research conducted by Barreira (2013), this study found no statistical significance for the association between the start of the offensive phase and goal scoring (Fgl). This could be attributed to the ‘patience’ strategy (Athanasiou, 2011, p. 30) within Manchester City’s possession. There might be too many passes between the winning of the ball and the eventual goal, for the data to show significance between the two variables. Table 6 presents findings (black for positive and underlined for negative associations) alongside findings emerging from existing published literature (shaded).

Table 6. Results of Start of Offensive Phase (Br) with End of Offensive Phase (F) (Black or Underlined for Positive or Negative Sequential Associations, respectively) Alongside Findings Emerging from Existing Published Literature (shaded) (Bakeman & Gottman, 1989; Sarmento et al., 2016).

<table>
<thead>
<tr>
<th></th>
<th>Fws</th>
<th>BRl</th>
<th>BRgk</th>
<th>BRp</th>
<th>BRst</th>
<th>BRv</th>
<th>BRgki</th>
<th>BRtl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fst</td>
<td>-9</td>
<td>(z = 3.23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fso</td>
<td>(z = 2.62)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fgl</td>
<td>(z = 2.63)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fled</td>
<td>(z = 2.63)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fgk</td>
<td>(z = 2.73)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fo</td>
<td>(z = 2.63)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fi</td>
<td>(z = 2.73)</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

This, more specifically, start/restart of offensive phase shows a significant in Manchester City’s ability to keep the ball as to the significant inhibition of Fled, which is potentially known for the fact that one of Pep’s attacking strategy is that of overload to attract opponents, and then attacking from the other side, hence less possibility to lose the ball (Segrave et al., 2018). This brings in an evident principle of play which leads City not getting under absolute pressure, possibly assisted through their mastery of going backwards to play forward (Poli et al., 2012), or more influent players in relation with the opponent in the centre of the game” (Pa) (Barreira, Garganta, & Anguera, 2013, pp. 14–15).
(Pr z=29.46, n = 350; Pa z=11.31, n=22). It is here pertinent to underline the interaction between this finding showing absolute and numerical inferiority in zone 11, but yet, as mentioned earlier, there is a negative association between this zone and Fled (Figure 3).

Figure 3. Results of the Negative Associations of the Center of the Game to Patterns of Pitch Space Position.

The positive associations of ‘the Centre of the Game’ (Pa, Pr, Pe, NPe, NPr, NPa) to the zones (Figure 4) almost show a mirror image of the association shown above. Zones 1, 2, 3, 4, 5 and 6 induced situations with relative or absolute numerical superiority. Zone 4, however, induced situations of numerical equality with pressure, which could be showing a significance of where Manchester City got pressed. Zones 7, 9 and 10 show a higher association with numerical equality with and with no pressure. This is a strong indicator of Manchester City’s attempt to shift the ball fast to obtain 1v1 or 2v2 opportunities on the wings, both with fast and effective wingers and with the addition of attacking minded full backs (Segrave et al., 2018). Zones 8 and 12 were associated only with numerical equality with no pressure and numerical equality with pressure, respectively.

Figure 4. Results of the Positive Associations of the Center of the Game to Patterns of Pitch Space Position.
In the defensive sector (zones 1, 2 or 3) Manchester City were able to build up play with a negative association to PA and NPe (zones 1, 2 or 3) and with positive association to NPs (zones 1 & 2) and NPr (zones 2 & 3). This is further sustained by situations of NPa and NPr in zones 1 and 2, and in zones 2 and 3, respectively (Figure 3).

In the defensive sector (Barreira, Garganta, & Anguera, 2013) City’s attacking play was negatively associated with Pr and NPe (Zone 4), Pr (Zone 6) on the flanks, and with Pa, Pr, Pe and NPe in the central part of the mid-defensive sector. When they were in the mid-defensive sector, City managed to develop play by assuring they did not get in absolute or relative numerical inferiority and numerical equality with or with no pressure, and by having relative numerical superiority (NPr; zones 4, 5 and 6) and absolute numerical superiority (NPa; zone 5). Another important association of numerical equality with pressure was found in zone 4, which, as argued earlier, could have been a strategic position where City were pressured by their opponents when their full back received the ball. It could also be known to the fact that their right back (mainly Walker) is “extremely attack oriented” (Segrave et al., 2018, p. 7) hence might have received the ball in zone 6 less than the opposite full back who may have received the ball more in zone 4, and hence giving the opportunity to opponents to press him.

It is also important to add that these findings of numerical superiority in zone 5 may be attributed to at least the following points.

1. Possibly City’s opponents were withdrawing early in the defensive phase, and hence they were already below their midline pitch, hence it stands to reason that City were with more numbers in their mid-defensive sector.
2. It is possible that the fact that City were sometimes raising a Centre Back to add numbers in midfield (Rodri, No 16, was doing this against Atalanta), or get the inverted full backs (Segrave et al., 2018), who may arguably be better called halfbacks (Cox et al., 2020), could be adding numbers in the central mid-defensive sector (zone 5).
3. Through their ‘patience’ strategy (Athanasios, 2011, p. 30), Manchester City did repeatedly pass the ball back to their Centre Backs (CBs) if they did not find the gaps to penetrate higher up the pitch.

As shown in Figure 5, the mid-offensive sector (zones 7, 8 and 9), saw an increase in the negative association with relative and absolute numerical superiority. Furthermore, zones 7, 8 and 9 had an increased association with numerical equality with and with no pressure. Zone 8 was also the first zone to induce relative numerical inferiority, which is defined as when “the observed team has one or two influent players less than the opponent in the centre of the game” (Barreira, Garganta, & Anguera, 2013, p.14). While this increased significance in situations with numerical inferiority in zone 8, is in actual fact expected, it is equally interesting to highlight that on the flanks (zone 7 and 9), City still managed to inhibit ‘absolute (Pa; z=2.14) and relative (Pr; z=5.91, n = 69) numerical inferiority’ in zone 7, and similarly inhibiting ‘relative numerical inferiority’ (Pr; z=-1.97, n = 81) in zone 9. This could be known to the movements of both CAMs in between the lines and between the opposing full backs and central backs, and also to the higher movements of the full backs (Segrave et al., 2018).

Finally, the offensive sector (zones 10, 11, 12) inhibited absolute (NPa) and relative (NPr) numerical superiority. ‘Numerical equality with (Pe) or with no (NPe) pressure’ were induced in zone 10, ‘absolute numerical inferiority’ (Pa) and ‘relative numerical inferiority’ (Pr) were induced in zones 11 and 12, while ‘numerical equality with pressure’ was also induced in zone 12.

## CONCLUSION

During the group stage of the UEFA Champions League 2019-2020, Manchester City’s end of offensive phase was made of 82.92% with no efficacy and 17.07% with efficacy. The end of offensive phase with efficacy was highly associated with Zone 11 (Fws z=4.14; Fst z=2.34; Pg z=4.61). The same zone was negatively associated with ‘loss of ball possession by error of the ball carrier / defender’s intervention’ (z=-7.74). On the other hand, zones 5 (Fled z=2.66) zone 8 (Fled z=-6.41), zone 9 (Fz =5.31) and zone 11 (Fgk z=7.32), induced the end of offensive phase with no efficacy. ‘Relative numerical inferiority’ induced ‘loss of ball possession by error of the ball carrier / defender’s intervention’ (119; z=2.49; p=0.01) and ‘loss of ball possession by the intervention of opponent’s goalkeeper’ (20; z=2.52; p=0.01), while ‘numerical equality with no pressure’ induced ‘wide shot’ (13; z=2.77; p<0.01), and ‘throwing ball out of the pitch’ (14; z=2.51; p=0.01).

City’s ‘loss of ball possession by error of the ball carrier / defender’s intervention’ was associated with the interaction between Manchester City’s forward line and opponents’ midline (FM; z=2.66) and the interaction between midline to midline (MM; z=4.18). The interaction between the exterior zone of the offensive line with the opponents’ backline (EB) induced ‘throwing the ball out of the pitch’ (z=4.44), while the interaction between ball in the offensive line (F) and the Empty Zone (E) was associated to ‘loss of ball possession by the intervention of opponent’s goalkeeper’ (z=14.81). Finally, one can notice that there was a high association of relative and absolute numerical superiority, and a negative association of absolute and relative numerical inferiority with the zones in the defensive sector and mid-defensive sector. The mid-offensive sector shows a still positive, but lower association, while the offensive sector, mainly zones 11 and 12 have a high association with absolute and relative numerical inferiority, and a negative association with numerical superiority.

## CONTRIBUTIONS, IMPLICATIONS, AND SUGGESTIONS

This paper contributes by filling in an existing gap of academic literature focusing on Pep Guardiola’s Manchester City. This empirical study presents some theoretical and practical implications. First, its method promotes the idea for sports coaches, match analysis and researchers focusing on match analysis to go “beyond traditional analysis of frequency of sports behaviours” (Hugo Sarmento et al., 2010, p. 406), and instead delve deeper into conceiving football as a complex system (Gréhaigne et al., 1997). While it may be useful in informing coaching practice and to present values that can be used as normative data (Mitrotasios & Armatas, 2012), it is more contextual and realistic to move away from simple description and associations between variables, and consider the possible interactions between variables,
considering the dynamic, interactive and complex systems’ aspects that can better characterise match performance in football (Sarmento et al., 2014).

Figure 5. Results of the Positive and Negative Associations of the Center of the Game to Patterns of Pitch Space Position.

Furthermore, considering the limitations this study might have in it presenting a case study of just one team in one phase of a competition, it is hereby argued that as more researchers adopt and apply the methodology to additional games, then, important insights can be revealed about broader and more overarching trends, enabling a form of comparative analysis that would facilitate inferences about contracting styles between teams, leagues and larger interconnected football philosophies and cultures.

With this insight this study can practically imply that the interactions between space, interactions and behaviours were pertinent in underlining Manchester City’s end of the offensive phase. These findings can in fact imply that Manchester City’s end of offensive phase with efficacy is related to zone 11, through forward mobility, which might be benefiting from City’s ability to obtain numerical equality on the flanks (zones 7, 9 and 10). Furthermore, findings show that it is not probable that City will lose the ball in zone 11, unless they are in a 1v1 against the Goalkeeper, in which case, the ball is lost by intervention of the opponent’s goalkeeper, following an interaction between City’s offensive line and the opponent’s goalkeeper (E). This shows both the technical ability of Manchester City’s players attacking the penalty box, but also their mastery to pass backwards to play forward (Poli et al., 2021) again later on, which leads them to always pass away from traffic, to retain possession of the ball.

Finally, it is hereby suggested that future research, should take in consideration various factors such as type of competition, stadium location, home and away advantages and disadvantages, opponent quality, partial results and number of players on the field exploring statistical significance of a team/teams’ offensive phase in relation to these factors, would contextualise findings and understandings even more.
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A Qualitative Study of Secondary Physical Education Teachers’ Job Satisfaction in Japan, South Korea, and the United States

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ABSTRACT

The purpose of this study was to qualitatively explore the themes and factors surrounding secondary PE teachers’ job satisfaction and to find similarities and differences in the factors that influence job satisfaction among secondary school physical education (PE) teachers in Japan, South Korea, and the United States. Using a purposive sampling, nine secondary school PE teachers, three in each country, were recruited. A total of five investigators visited each participant’s school for an entire day and collected field notes while observing PE sessions. At the end of each class period, each participant reported their job satisfaction on an 11-point visual analog scale, and a semi-structured interview was conducted in their native language. Four primary themes surrounding job satisfaction emerged: 1) student behavior, attitude, & motivations, 2) teacher’s workload including their compensation and work-life balance, 3) their relations with coworkers, and 4) administration, funding, & professional development support, among which workload and student behaviors were consistently reported in all three countries. Future research should quantitatively examine, with a larger sample size, the interrelationships of these identified themes impacting overall job satisfaction in secondary PE teachers.

Keywords: administrative relations; co-worker relations; job satisfaction; physical education; student relations; workload

INTRODUCTION

Kindergarten to 12-grade (K-12) educators take important roles in youth’s growth and development and comprise a large percentage of the entire workforce in a developing country, yet such profession experiences disproportionately high levels of job dissatisfaction and a decrease in job motivation over time (Boe et al., 2008). Particularly in education, Ingersoll et al. (2018) reported rates of attrition (switching positions within the same career or leaving the career altogether) to be 44% of new teachers within the first five years of their career, with primarily reasons being poor compensation, student misbehavior, and lack of administrative support. Per the Wisconsin Budget Project report (2017), school districts in Wisconsin faced extreme teacher shortages, with 46% of openings (1,153 jobs) including physical education teachers. Mousavi et al. (2012) and Dobell et al. (2021) suggests that PE is recognized as an important tool to ensure sufficient physical activity and that PE teachers play an important role in developing students’ behaviors, attitudes, skills, and knowledge necessary to establish a lifelong physical activity. Given the enormous impact physical inactivity has in increased global morbidity, mortality, and health care costs, it is important to find strategies to maintain the quality of PE teaching by recruiting and retaining qualified K-12 Physical Education (PE) teachers in the United States (U.S.) Perhaps, understanding the factors associated with job satisfaction or dissatisfaction is one of keys to decrease the high attrition rate.

Among non-PE teachers, facets that determine teachers’ satisfaction have been reported as supported administration, staff collegiality, and positive interactions with students (Merrimack College & EdWeek Research Center, 2022; Platsidou & Agaliotis, 2008; Rhodes, Nevill, & Allan, 2004; Skaalvik, 2011). Facets related to job dissatisfaction have been reported as low pay, limited resources, large class size, disengaged administration, role overload, and negative interactions with students. In terms of PE, Carson et al. (2016) found that, for the three late career experienced PE teachers, peer support greatly influenced their job satisfaction. Moreover, the participants preferred less
administerative oversight, however, Carson et al. (2016) had noted that this decreased oversight reduced teachers’ involvement in administrative decisions. Per Skaalvik (2011), most teachers experienced a considerable number of disruptive behaviors among their students, which directly correlated with work-related stress and emotional exhaustion, leading to higher job dissatisfaction. In terms of the financial aspect of the secondary teaching profession, Certo and Fox (2002) reported that teachers with higher salaries had higher levels of job satisfaction; however, according to Gu (2016), only 38.0% reported high satisfaction with their salary. Based on the literature available, there is evidence related to job satisfaction and dissatisfaction among late career teachers. However, it is important to explore earlier career PE teachers whose attrition rates are higher. Challenges and struggles also exist among early career urban PE teachers in that majority of them are White, yet the highest need for teachers are in urban districts where the student population is largely African American and Hispanic (Flory, 2016).

Comparatively to the U.S. teaching profession, high job-related stress among teaching professionals has also been reported in other countries such as Japan and South Korea (Ha et al., 2011; Nagai et al., 2007), yet teachers in these Asian countries tend to stay within the profession relatively longer than those in the U.S. According to the Ministry of Education, Culture, Sports, Science and Technology-Japan (2021), attrition rate of public school non-retiring teachers working at elementary, middle, and high schools was calculated to be 1.2%. Based on the Teaching and Learning International Survey (TALIS) report [Korean Educational Development Institute (KEDI), 2018] on South Korean teachers, they indicated that it is a rare to address attrition rate for teachers in relation to their work-related stress due to their focus on developing teachers who are already in the system instead of trying to attract new teachers. In fact, the only data related to leaving the teaching position for South Korean teachers is whether they are hoping to retire early after spending 20 years in their profession (KEDI, 2012).

A comparative study by Ingersoll (2007) described that individual pursuing to become elementary and secondary public-school teachers in South Korea and Japan are not only required to complete a college degree to obtain a teaching certificate, but they would also be required to pass a quite challenging exam that is regulated by the state or prefecture. Additionally, in South Korea and Japan, teaching is a sought-after profession for its high social status standing; thus, relatively competitive individuals aspire to become teachers and the rate of turnover is very low (Ingersoll, 2007). Entering the teaching profession in the U.S. is relatively easy as compared to other countries (Wang et al., 2003 as cited in Ingersoll, 2007); yet teaching is a relatively complex form of work that requires a multitude of skillset to do well (Ingersoll, 2007) which may potentially lead to decreased job satisfaction.

From a curricular perspective, the most significant difference across the three countries is that the objectives and content of K-12 PE in Japan and South Korea are determined at the national level. In the U.S. in 2013, the Society for Health and Physical Educators in America (SHAPE-America) had re-established a set of national standards and grade-level learning outcomes for PE in K-12 schools to provide guidance for PE teachers to follow in their lesson plans with much flexibility to meet the students’ needs. More recent movement has started to favor the profession of health and PE in the U.S. After the U.S. Congress passed Every Student Succeed Act (ESSA) in December of 2015, which replaced the No Child Left Behind, the health and PE profession has begun to receive more federal education funding as the subject being recognized as part of each student’s “well-rounded education,” allowing states and school districts the opportunity to improve school health and PE programs (SHAPE-America, 2016). Even after this shift in the educational system, there still seems to be a high attrition rates of PE teachers. Therefore, the aim of the study was two-fold: 1) to explore factors related to job satisfaction and dissatisfaction among PE teachers in the U.S. compared to the two Asian countries where the attrition rates are lower; and 2) to gain insights on preparing in-service teachers, recruiting new teachers, and retaining qualified PE teachers in the U.S.

METHODS
Participants
Using purposive sampling (Patton, 2015), three physical educators from each country of Japan, South Korea, and the U.S. were recruited, for a total of nine secondary PE teachers. Prospective participants were recruited via faculty connections in each respective country, and eligibility was determined via phone or e-mail correspondence. Informed consent was obtained prior to participation in accordance with the University Institutional Review Board. Participant demographics are presented in Table 1.

Study Procedure
Data were collected in the U.S. during March 2017, and data for Japan and South Korea was collected in June and July 2017 at each respective school site (i.e., gym, office, and classroom). Using qualitative research method (Creswell & Poth, 2017; Patton, 2015; Stake, 1995), researchers spent a total of one day at each school site in the U.S., and two days at each school site in Japan and South Korea: On day 1, researchers observed one full day of participants at their school. During observation, researchers followed the participants throughout their day, writing detailed field notes regarding the activities of the day and their perception of each participant’s job satisfaction. Field notes included work activities; interpersonal interactions with students, coworkers, and administration; general observations and items of interest; and the demeanor of the PE teacher throughout the day, including facial, body and/or verbal expressions that may have indicated their job satisfaction.

After each period, researcher presented a blank job satisfaction graphing chart using an 11-point modified pictorial pain scale (see Figure 2), with time on the x-axis and job satisfaction, ranging from complete dissatisfaction (0) to complete satisfaction (10), on the y-axis. Using a modified pain scale, participants indicated their job satisfaction after each class period on a scale from 0-10, with 10 being completely satisfied and 0 being completely dissatisfied. Per Brief and Roberson (1989), a face rating scale is appropriate for determining the disposition of job satisfaction and was used by Carson and colleagues (2016) in their analysis of three late career PE teachers. While Carson and colleagues (2016) have their participants fill out the graph at the end of the day, researchers in this study prompted teachers at the end of each period to capture the instant job satisfaction throughout the day. The use of the scale was explained to each of the participants in their native language.
After completing the observations, participants responded to a 25 to 90 minutes semi-structured interview (Creswell & Poth, 2017; Patton, 2015; Stake, 1995) in their native language on either the day of the observation or the following day depends on the participants’ availability. The questions included such as “Can you describe a typical day as a physical education teacher?”, “In what ways are you satisfied with your job?” and after pointing at their completed Figure 2, “Why did you mark the graph this way? What happened at that time?” Audio files of all interviews were recorded on an Olympus digital voice recorder. Transcriptions of the interviews were created by native speakers of the respective interview language residing in the U.S. Transcriptions of the data were then translated into English languages by the same individuals who have completed the transcription process. The authors YO and SB reviewed their transcription and translation once completed.

**Data Analysis and Trustworthiness**

Data were analyzed using categorical aggregation and direct interpretation (Creswell & Poth, 2017; Patton, 2015; Stake, 1995). To ensure data trustworthiness, researchers used triangulation suggested by Creswell & Poth (2017) and Patton (2015). Triangulation included 1) direct observation field notes, 2) participants’ job satisfaction ratings, and 3) semi-structured interviews. Researchers analyzed the data with a sense of correspondence to understand behavior, response, and context by looking for a pattern (Stake, 1995). All researchers independently reviewed the satisfaction graphs and transcriptions of the interviews to develop emergent themes for each participant, then compared their independent coding to identify common themes across the interviews and derived a consensus coding for these themes.

**Table 1. Participant Demographics, Workload, and Additional Duties**

<table>
<thead>
<tr>
<th>Participant*</th>
<th>Country</th>
<th>Age Range (years)</th>
<th>Sex</th>
<th>Years of Teaching</th>
<th>School Level</th>
<th>School Type</th>
<th>Work hours</th>
<th>Number of classes</th>
<th>Additional Duties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jordan</td>
<td>U.S.</td>
<td>30-40</td>
<td>F</td>
<td>13</td>
<td>High School</td>
<td>Public</td>
<td>6:30am-3:00pm</td>
<td>5</td>
<td>Lifeguarding, hall duty, open doors, coaching</td>
</tr>
<tr>
<td>Alex</td>
<td>U.S.</td>
<td>&gt;40</td>
<td>M</td>
<td>18</td>
<td>Middle School</td>
<td>Public</td>
<td>7:30am-3:35pm</td>
<td>7</td>
<td>Lunchroom duty, coaching</td>
</tr>
<tr>
<td>Taylor</td>
<td>U.S.</td>
<td>30-40</td>
<td>F</td>
<td>14</td>
<td>High School</td>
<td>Public</td>
<td>7:30am-3:00pm</td>
<td>6</td>
<td>Teach health education, coaching</td>
</tr>
<tr>
<td>Bailey</td>
<td>Japan</td>
<td>&lt; 30</td>
<td>F</td>
<td>3</td>
<td>High School</td>
<td>Public</td>
<td>8:00am-5:30pm</td>
<td>3-4</td>
<td>Homeroom teacher</td>
</tr>
<tr>
<td>Aaron</td>
<td>Japan</td>
<td>&lt; 30</td>
<td>M</td>
<td>7</td>
<td>Middle School</td>
<td>Public</td>
<td>7:30am-6:30pm</td>
<td>3-6</td>
<td>Supervising club activities</td>
</tr>
<tr>
<td>Hudson</td>
<td>Japan</td>
<td>&gt;40</td>
<td>M</td>
<td>25</td>
<td>High School</td>
<td>Private</td>
<td>7:45am-7:00pm</td>
<td>2-4 (Mon-Sat)</td>
<td>Supervising club activities</td>
</tr>
<tr>
<td>Chris</td>
<td>South Korea</td>
<td>30-40</td>
<td>M</td>
<td>9</td>
<td>Middle School</td>
<td>Public</td>
<td>8:40am-5:00pm</td>
<td>3-5</td>
<td>Homeroom teacher; Coaching for 2 club sports</td>
</tr>
<tr>
<td>Riley</td>
<td>South Korea</td>
<td>&gt;40</td>
<td>M</td>
<td>19</td>
<td>High School</td>
<td>Public</td>
<td>8:40am-5:20pm</td>
<td>2-4</td>
<td>None</td>
</tr>
<tr>
<td>Sam</td>
<td>South Korea</td>
<td>30-40</td>
<td>F</td>
<td>12</td>
<td>High School</td>
<td>Public</td>
<td>8:40am-5:00pm</td>
<td>3-4</td>
<td>Homeroom teacher</td>
</tr>
</tbody>
</table>

**Note.** *Participant names were randomly assigned to participants for confidentiality purposes; F = female; M = male
RESULTS

In the data collected from this study, four main themes surrounding job satisfaction and dissatisfaction among physical education teachers emerged (See Figure 1). These included: 1) student behavior, attitude, & motivations, 2) teacher’s workload including their compensation and work-life balance, 3) their relations with coworkers, and lastly 4) administration, funding, & professional development support.

![Figure 1. Four Main Themes Surrounding Job Satisfaction Among Physical Education Teachers](image)

**Student Behavior, Attitude, & Motivations**

Relationship with their students, which included students’ behavior, attitude, and motivations, was the single greatest theme across the three countries. There was a general agreement among teachers from all three countries that students’ positive behaviors and motivation to be active and putting efforts in the activity positively affected their job satisfaction. We saw a Japanese teacher rated his job satisfaction as being 10 (highest satisfaction rating; see Figure 2) at 2pm because of his students’ behavior and attitude in his golf class. In addition to the behavior and attitude, teachers also indicated higher job satisfaction when he saw high motivation and caring minds towards other peer students (e.g., sportsmanship, See Table 2).

Teachers also shared their job dissatisfaction in relations to students’ behavioral issues including students not taking good care of equipment, not wanting to sweat or ruin their makeup (most stated in South Korea), not wearing proper gym attire or uniform, and bullying or behavioral issues. Additionally, teachers in both Japan and South Korea shared their frustration when students were not paying attention to instructions and engaging in off tasks. Both Bailey (5 at 12pm) & Aaron (6 at 10am) from Japan rated lower job satisfaction (see Figure 2) due to students’ lack of motivation.

Riley from South Korea rated 4 at 11 am due to his students’ attitude and behaviors. Based on our observation with field note, some students sitting out and a small group of students playing non-PE related games. A few female students came in school uniform skirt with throw blankets around their waist which is not appropriate athletic attire for PE. He added that “After the class, my job satisfaction went up [to 7] since the stress on the students is gone.” *(Riley, South Korea, Male High school Teacher)*.

**Workload, Compensation and Work-Life Balance**

Workload was the most common theme related to their job dissatisfaction discussed by teachers from all three countries. Workload included number of classes taught as well as any job duties, such as lifeguarding or hallway supervision. All three counties had different teaching schedules. Refer to Table 1 for workload for each participant. When we asked to describe a typical week as a PE teacher, Jordan said that her job satisfaction graph as being low (5 points; See Figure 2) at 10am due to no support staff available in her integrated class where she would need at least one support staff for her student with visual impairment (see Table 2).

Coaching was not part of their teaching job, but there is an expectation for PE teachers from school to take that additional responsibility. Taylor spoke about previous year’s struggles and trying to balance all components in their life (see Table 2). Similar to Coaching responsibility in U.S., all teachers in Japan supervised a club activity that meets after school. Aaron and Hudson said they get home around 7:00 pm after supervising club activities. The clubs meet before and after school, in some cases, also on weekends. When we asked if they felt like they were sacrificing areas of their personal lives, Hudson responded, “I feel that every day”. Hudson, in particular, is working from Monday through Saturday, and said that “I have no days to rest.” and added that, “Some of the teachers have been questioning the balance between their workload and salary.” *(Japan, Male High school Teacher)*.
Japanese and South Korean teachers taught between 2 to 5 (South Korea) or 6 (Japan) PE classes during the day along with being a homeroom teacher (i.e., teacher who is in charge of a subgroup of students in a specific grade regardless of the subject they teach; the students report to their assigned classroom at the beginning of the day and at the end of the day for school announcements. They are called “tan-nin” in Japanese and “danim” in Korean). Homeroom teacher duty was common in both Japan and South Korea. Homeroom teachers begin and end the day with their homeroom students. They take care of a group of students regarding their overall academic performances and behavioral issues. Both Chris and Sam from South Korea were homeroom teachers. They expressed dissatisfaction of being homeroom teachers. When we asked Sam to reflect on why she rated her job satisfaction as 5 for both at 9am and 3pm, she related this to her duty as a homeroom teacher (See Table 2). Similar to other teachers, Chris also brought up the issues of sacrificing his own personal time due to his workload (See Table 2).

Most teachers were dissatisfied with their pay, especially when considering their salary in relationship to their workload. Those who expressed satisfaction had either been in their position for many years or compared their salary to their pay in a different field (i.e., Hudson and Riley). Salary raises in Japan and South Korea were annual and tiered based on work experience. In the U.S., the teachers interviewed had received raises this year, but indicated they had been on a pay freeze for 6 to 8.5 years. Across the board, teachers indicated their raises only accounted for a pay increase of a few hundred dollars. However, most expressed satisfaction for the health benefits of being physically active in their job, and Jordan, a U.S. teacher expressed excitement in getting “a wonderful retirement plan”.

![Figure 2. Single-Day Job Satisfaction Rating of the Nine Participants](image)

**Coworker Relations**

Coworker was the third most discussed theme in this study. Coworkers were determined to be other teachers that they work with in the school. Participants distinguished their coworkers by two different groups: 1) PE teachers in the same department and 2) non-PE teachers. Generally, participants in this study were satisfied with their PE coworkers, but not with non-PE coworkers. U.S. teachers mentioned that they are highly satisfied with their PE coworkers. Jordan spoke of her department calling them her “second family” (see Table 2). Both Japanese teachers and South Korean teachers expressed that “meeting good colleague” is important for their job satisfaction (see Table 2). Japanese teachers also had the highest satisfaction expressed over PE coworkers. Aaron talked about how he team teach with his coworkers at their school, “it has been very productive and efficient”. Based on the observation through field notes, Aaron seemed efficient in teaching swimming lessons with another teacher by taking turns to lead and be responsible for the whole class alternatively. South Korean teacher Sam spoke about the flexibility and openness of her department coworker when she requested a unit that was not their specialty. Participants in U.S. and South Korea expressed their dissatisfaction based on disrespectful behaviors from their non-PE coworkers. In the U.S., Jordan talked about disrespectful behavior from non-departmental coworker who came into the gym during her class time, without asking, to teach a science class (see Table 2). Riley from South Korea also shared his frustration with disrespectful comments from non-PE teachers towards PE teachers (see Table 2).
**Administration, Funding, & Professional Development Support**

The last common theme related to the job satisfaction and dissatisfaction that we saw was on teachers’ relationship with administrative staffs and administrative support for teaching. Administration was defined as administrators in the building the teachers worked at, such as principals and vice principals as well as the school district, board office, and government. Teachers from the three countries reported that their administrative members were supportive and seemed to understand what teachers need (see Table 2). Both Japanese and South Korea teachers also shared their job satisfaction in relations to how their principals accept new ideas.

In terms of funding and resources, U.S. teachers expressed dissatisfaction for both funding and resources whereas South Korean and Japanese teachers were satisfied with their available funding and resources. Taylor from the U.S. described their equipment as “old and outdated” and “breaking and ragged” while another participant, Alex, hesitantly described their equipment as “adequate” for their budget. Jordan spoke about an external grant that they needed to write to get resources and said “it would be nice if we could have more” when asked about resources. She added that “I got a grant I bought 33 heart rate monitors and did it with my strength and conditioning class... It took me probably 2 months to write the grant... there’s just so much paperwork and process that a lot of times you just get weighed down” (U.S. Female High school Teacher).

Hudson from Japan stated, “a wide range of PE-related instruments and resources are available here” (Japan, Male High school Teacher). One thing to note here is that Hudson’s school is a private school where they have more funding to support such equipment for classes. On the other hand, Aaron indicated that “if it is under [$100], they can get new resources” (Japan, Male Middle school Teacher). He expressed that he is pretty satisfied about the amount of funding he would get.

There were noticeable differences in funding availability to South Korean teachers compared to U.S. and Japanese teachers. South Korean teachers received funding ranging from $4,000 to $30,000 per year. Riley believed they have more resources compared to other teachers (in South Korea) and added that they receive about [$30,000] a year; but still noted as a “reduced budget” (Riley, South Korea, Male High school Teacher).

With respect to professional development opportunities, all teachers attend professional development when it is offered by their administration. However, the common theme is that they don’t get support such as time off and funding resources to attend the subject specific professional development unless they were given grant or funding. Taylor from U.S. explained that their school district nurse received the funding for health and PE to go to conferences; however, they would have to find their own funding as the grant cycle was ending. Getting time off for attending conventions depends on the school districts and principals in U.S.

Just like U.S. teachers, Japanese and South Korean teachers attend professional development training run by the Ministry of Education without additional cost, but they generally do not get funding support on professional development outside of what administration offers such as the national and local state level PE and health educator’s convention and continuing education (see Table 2). Sam, a South Korean teacher, shared with us that she was part of a PE professional learning community, As such, much for the expenses related to professional development activities were covered by the individual teachers.

**Table 2. Participants’ Quotes by Themes of Job Satisfaction Extracted from the Interviews**

<table>
<thead>
<tr>
<th>Participants’ Pseudonym, Country, Sex, &amp; School</th>
<th>Job Satisfaction Related to Student Behavior, Attitude, and Motivations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jordan, U.S., Female High school Teacher</strong></td>
<td>“The kids are just, they’re fun and they’re wanting to be active, I just, you know, I get to teach, I don’t have to worry about behaviors. And so, my semester has been lovely... My adapted (PE) kids keep me humble and keep me laughing.”</td>
</tr>
<tr>
<td><strong>Hudson, Japan, Male High school Teacher</strong></td>
<td>“The class consists of a small number of high school seniors who love playing golf. Regardless of golf abilities, they are always eager to practice playing golf.”</td>
</tr>
<tr>
<td><strong>Chris, South Korea, Male Middle school Teacher</strong></td>
<td>“I feel rewarded as a PE teacher when students exercise with high motivation, when they improve their motor skills, or when they show care for the others.”</td>
</tr>
</tbody>
</table>

| **Job Dissatisfaction Related to Student Behavior, Attitude, and Motivations** |
|-----------------------------------------------|---------------------------------------------------------------------|
| **Jordan, U.S., Female High school Teacher**   | “you’re not doing what it is, you’ve got a million kids that are like ‘you suck’, ‘I don’t like you’, ‘why do I have to do this’. Um it, it, it wears on ya.” |
| **Bailey, Japan, Female High school Teacher**   | “my instructions appeared to be not clear to my students. Also, I was little irritated by their lack of physical performance during the class... They did not show their best in today’s class.” |
| **Riley, South Korea, Male High school Teacher** | “The biggest stressor is students. If they are not paying attention in the class, I get a lot of stress... I was worried today about the first class [at 11am] because they do not have good class attitudes... In the case of today, since their final evaluation was over and there was nothing that I can hold the students accountable. I was feeling a little bit upset because there were few students who were acting on their own way.” |
### Participants’ Quotes by Themes of Job Satisfaction Extracted from the Interviews (continued…)

<table>
<thead>
<tr>
<th>Participants’ Pseudonym, Country, Sex, &amp; School</th>
<th>Job Dissatisfaction Related to Workload, Compensation and Work-Life Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jordan</strong>, U.S., Female High school Teacher</td>
<td>“We have 36-38 student [per] class. Um so unfortunately, we are bombarded with too many kids in our class and we’re kind of teaching our workload…Third hour is 9-10am, it’s my integrated class. I have only 4 students that are integrated into a regular ed class. And we try to treat them exactly like um, the other students with the support of me. Um, having [a support staff] is huge right now because I have a girl that is very visually impaired and [student] has to be 1 on 1, so when [a support staff] is not here, it is hard to man myself, I don’t have a support staff in that class as of now. … Uh, It’s just, it’s a lot of work.”</td>
</tr>
<tr>
<td><strong>Taylor</strong>, U.S., Female High school Teacher</td>
<td>“Two babies at home, trying to coach, teach and commute, it just all adds up…I’m-I coach JV right now. The district really promotes – encourages is a better word – PE teachers to coach. It’s almost mandatory. I was spending more time with other people’s kids than I was with my own and. It’s for some people; it’s not for me. I can’t do the Mom thing”</td>
</tr>
<tr>
<td><strong>Hudson</strong>, Japan, Male High school Teacher</td>
<td>“I have no days to rest…Some of the teachers have been questioning the balance between their workload and salary.”</td>
</tr>
<tr>
<td><strong>Sam</strong>, South Korea, Female High school Teacher</td>
<td>“The homeroom teacher has a lot of responsibilities…So many people do not want to be a homeroom teacher…There is only [$100] per month as an extra pay for being a homeroom teacher…I do not want to do it, but I have to do it. …At 9 am, I am busy with morning assembly and first class and my homeroom students are very hard. There are many students who cannot concentrate and are distracted. It is hard psychologically burdensome to make them concentrate in the class. My homeroom class is the hardest…They talk a lot of words like ‘why are we doing this?’ or ‘I do not want to do this’.”</td>
</tr>
<tr>
<td><strong>Chris</strong>, South Korea, Male Middle school Teacher</td>
<td>“I have classes of 20 hours per week, and do homeroom teaching tasks and administrative work, it overloads workload. There is a lack of time for professional development and communication with colleagues. If we want to do the work properly, we must sacrifice our personal time”</td>
</tr>
<tr>
<td><strong>Jordan</strong>, U.S. Female High school Teacher</td>
<td>“I am very blessed with the department that I enjoy being with. They truly are your second family, I mean, I spend more time with my work family than I do with my home family sometimes. We work really well together, we have fun, we enjoy each other, and we support each other. I think that’s a huge environment to have”</td>
</tr>
<tr>
<td><strong>Aaron</strong>, Japan, Male Middle school Teacher</td>
<td>“It is so important to have good people that you really like to work with” and later said “our group here really, really works well together”</td>
</tr>
<tr>
<td><strong>Chris</strong>, South Korea, Male Middle school Teacher</td>
<td>“This part is important. The ties with other physical education teachers, the teachers’ interests towards physical education lessons, their capabilities, whether I have something new to learn from them, and whether they are active and sharing information. Such things affect the satisfaction. I think it is important to meet good colleagues. It is acceptable here…The interactions with coworkers is very positive for me.”</td>
</tr>
</tbody>
</table>

### Job Dissatisfaction with Non-Physical Education Coworkers

| **Jordan**, U.S. Female High school Teacher | “We stick up for our space. It’s like no, you aren’t going to bring in your physics class to shoot baskets just because my volleyball class can move off to the side…that becomes a little uncomfortable (laughs) you have to have some uncomfortable conversations and they may not always agree” |
| **Riley**, South Korea, Male High school Teacher | “I get upset when I hear the thoughts from other non-PE co-workers such as PE teachers are uneducated, or that we cannot complete other roles well etc.” |

### Job Satisfaction with Administrator

| **Jordan**, U.S. Female High school Teacher | “I have a very good relationship with administration. I think that the only time that I see them (laugh) is during the beginning of the year and end of the year. One of the vice principals was our athletic director and he was an old PE (teacher) so you know he kinda gets our world and appreciates our world which is nice” |
The purpose of the current study was to explore the themes and factors surrounding secondary PE teachers’ job satisfaction and to find similarities and differences in the factors that influence job satisfaction between the U.S. and two Asian countries (i.e., Japan and South Korea) via direct observation of classes and in-person interviews. From the analyses, the study found four primary themes for job satisfactions: 1) student behavior, attitude, and motivation, 2) workload, compensation, and work-life balance, 3) co-worker relations, 4) administration, funding, & professional development support (See Figure 1).

With respect to student relations, all nine teachers reported higher satisfaction with their job when students presented positive behaviors, attitudes, higher motivation to learn, and following instructions. More specifically, when their students showed motivation for being physically active and giving effort in the class, they indicated a feeling of greater job satisfaction. They also shared similar job dissatisfaction when their students were disrespectful to teachers and showing unwillingness to participate in the class. In a comparative study by Dismore et al. (2006) on Japanese and English students’ view on PE, participants from both countries reported PE contributes to health and fitness, preparation for sports competitions and lifelong activity. Students’ attitudes and motivations to engage in PE lessons may improve if health and fitness mattered to them, which remains to be a challenge and continual efforts are made in the U.S. (Dismore et al., 2006).

In the interview from the U.S. teachers, we have noticed that students with special needs keep them humble and bring them laughter. This is a difference between the U.S. and the two Asian countries with respect to societal perspective on issues related to inclusion of students with disabilities in a learning environment. During our observation at one of the schools in Japan, we noticed that there was one student who was receiving an individualized instruction from the rest of the class on swimming with a special education teacher alongside other students. This student, however, did not include items specific to adapted PE; therefore, it would be of our interest to explore the perceptions and job satisfaction of Japanese and South Korean PE teachers on inclusion of students with special needs especially PE can provide students with a unique setting that allows for meaningful interactions between students and potentially improve attitudes towards other learners by implementing inclusive PE (Gainza & Castro, 2020). More recent examination of teaching context and professional socialization among pre-service and early career PE teachers indicated that there should also be strategies in place for communities of practice (Kern et al., 2019) and cultivating and orienting pre-service teachers in PE teacher education programs to better prepare them to be in a diverse workforce (Flory, 2016; Richards et al., 2019).

A similarity we have found related to workload and work-life balance across the three countries was that workload increased due to coaching responsibility added onto a normal teaching responsibility. Although teachers in the U.S. typically have a separate job contract to coach club or varsity sports, our participants have indicated they feel as if it was expected for them to take on this role. In Japan, coaching responsibility is embedded into a teaching contract, whereas in South Korea, club sports are embedded within normal teaching hours. Regardless, coaching responsibility has an influence on teachers’ perception of workload, especially when the coaching responsibilities occur on weekends, early mornings, and/or late evenings. These findings were consistent with Conley and You (2009) studies on higher workload and additional job duties negatively impacting their job satisfaction. In addition to coaching duty, teachers occasionally substitute for other teachers’ responsibility. In our study, one U.S. teacher (i.e., Taylor) was teaching Spanish class during our observation although she was uncomfortable with the subject. Ingersoll (2007) refer to “out-of-field” teaching as a problem that negatively affects the quality of teaching, potentially having some adverse effects on teacher’s job satisfaction.

In terms of co-worker relations, You and Conley (2015) illustrated in their study the five workplace predictors of intent to leave with three psychological mediators (i.e., job satisfaction, work commitment, and career commitment) that influenced the associations between the workplace predictors and intent to leave. In their illustration, the teacher team efficacy factor was a significant predictor for job satisfaction among novice (five years or less), mid-career (6-10 years), and veteran (11+ years) teachers in the U.S. More specifically, collegial work relations that would allow teachers to sense that they are part of a strong community would improve job satisfaction that
would lead to lower intentions to leave (You & Conley, 2015). Our findings were similar in that, when teachers felt as if their work (i.e., PE) was valued by their co-workers and their principals, they reported as having higher job satisfaction. Perhaps, there still is a residual nuance of lack of respect and value for PE from students and coworkers today.

Back in the 1970s, PE and school sports had been viewed as a "non-cognitive" subject, such that engagement in physical activity had little or no educational benefit (Bailey et al., 2009). There has been research providing evidence on not only the physical benefits of PE, but also the cognitive, social, and affective benefits that PE can offer to the students and the educational systems. More specifically, research has provided evidence that PE can foster development of social skills such as cooperation, teamwork, empathy, and a sense of personal responsibility (Ennis, 1999; Wright et al., 2004 cited in Bailey et al., 2009). As such, there needs to be a credible evaluation of the direct benefits of PE on social behaviors of students. As suggested by Bailey et al. (2009), long-term studies that capture mediators of the association between school-based physical activity and academic performance are necessary to provide evidence as an advocacy tool for quality physical education.

Consistent with previous research, job satisfaction is significantly influenced by administrative support (You & Conley, 2015). The shared characteristic of supportive principals was “open to new suggestions and ideas.” One of the distinctive themes that was different among three countries was funding. While all participants expressed the importance of funding to deliver effective PE, there were obvious differences in the amounts of funding across the three countries. U.S. teachers were generally dissatisfied with their funding and resources compared to South Korean and Japanese teachers. South Korean PE teachers in this study were getting funded ranging from $4,000 to $30,000 from school and government. South Korean teachers were generally satisfied with the amount of funding. One of U.S. teachers, Jordan, mentioned that she had to write an external grant proposal to fund heart rate monitors for her classes. The other U.S. teachers mentioned their equipment as either (hesitantly saying) adequate or old and outdated. Although there is an effort with funding PE programs in the U.S. with Every Student Succeed Act (ESSA), our participants did not seem to notice a difference. This is an area of further exploration in the next couple of years how ESSA has impacted physical educators’ job satisfaction.

It is of interest to note that, one of the subjects in Japan (i.e., Aaron), when asked about budget and funding provided by the school to purchase equipment necessary for teaching, did not seem to be dissatisfied by the relatively small amount of funding (i.e., approximately $100 each year). To explore this difference in perceptions on administrative support in the form of funding, we have related our findings to Lee et al. (2017) that revealed 6 first-order dimensions of job satisfaction and their influence on turnover intention among early-career employees. Through a structural equation modeling, they found that ‘personal growth’s influence was the highest followed by ‘salary and welfare.’ It may be that having a greater opportunity for personal growth in a job setting leads to higher job satisfaction, at least in the early-career stage. Additionally, Gil-Flores (2017) explained that sources of job satisfaction were more intrinsic to teaching, which partly explained our finding on one of the Japanese teachers who did not express dissatisfaction in the amount of funding that was available to him to purchase PE equipment. Perhaps, it is more important for the administrators to provide encouraging feedback to secondary teachers to improve their perceived self-efficacy in teaching that would then intrinsically elevate job satisfaction.

From a curricular standpoint, the obvious difference between the U.S. and the two Asian Countries was the existence of the national standards for PE in both South Korea and Japan (Ingersoll, 2007). Then a question might be on whether having a set of national standards facilitate student learning and achievement of physical fitness/healthy lifestyle. The answer to this question certainly is not simple. Centralized governance over school curriculum in South Korea and Japan is only possible in countries that favor collectivism vs. individualism, as indicated in Kim et al. (1990). Japan scores significantly low on the individualism scale, which puts low emphasis on equity (Kim et al., 1990). In a diverse country like the U.S., not placing an emphasis on equity in an educational setting is problematic. Additionally, the benefits of not having centralized governance in the U.S. is that it allows educators to have more flexibility to adapt to individual needs; thus, supporting the idea of equity in education. Perhaps what we can learn from this comparative observation is that the teacher evaluation procedure in the U.S. must include teachers’ efforts into creating an inclusive environment for all students and providing modified opportunities for students at all levels to engage in the kind of physical activities that would benefit them in the long run.

In the comparative study by Nakamura (2003) on the educational aspirations between Japan and South Korea, it is regarded as them having the same educational systems, such that there is a great social importance attached to university entrance examinations. Entering nationally renowned universities is socially highly regarded to which many students aim to enter, and if not admitted, they would take one or two full years to retake the entry examination. Once admitted, it is expected that they continue to pursue the degree that they had initially claimed. In terms of professional training requirements, in the U.S., there is an entryway to the education profession as a post-baccalaureate one-year teacher-preparation program; whereas, in Japan and South Korea, candidates are required to obtain a government-issued certificate or license certifying that a candidate has completed required professional preparation and training (Ingersoll, 2007). The examinations to obtain a license and position to teach a certain subject are difficult to pass the first time. For this reason, the occupation of teaching is highly regarded, and its social status is generally high in Japan and South Korea (Ingersoll, 2007). Unfortunately, in the U.S., teaching occupation has been characterized as non-competitive relative to other occupations and has been regarded as a less desirable line of work. Each state in the U.S. has their own requirement for licensing educators. For instance, the state of Wisconsin recently removed the requirement for completing the Educative Teacher Performance Assessment (edTPA) as of July 1, 2020. Especially with teacher shortage in the U.S., there have been changes in the licensing procedure of teachers, and some school districts offer teaching positions to candidates without having teaching licences with a contingency to acquire them within a couple years of their employment. Not only is the quality of teaching is questioned, it makes it challenging for those teachers to work on obtaining teaching licences on top of their teaching responsibilities.

The limitations of this study were that our participants also had a wide range of teaching experiences (i.e., 3–25 years). Additionally, although the interviews in Japan and South Korea were done in each country’s native language, the interview was transcribed in Japanese and Korean, then translated into English. Nuances in participants’ answers might have gotten lost in translation. This type of qualitative study is warranted targeting a specific group (i.e., early career) of PE teachers with a larger sample size to better understand the factors that may lead to poor job satisfaction and high attrition rate.
CONCLUSION

The four themes that were emerged from our data that influenced job satisfaction and dissatisfaction among PE teachers between Japan, South Korea, and the U.S. were: 1) student behavior, attitude, and motivation; 2) workload, compensation, and work-life balance; 3) co-worker relations; 4) administration, funding, and professional development support. Unique difference existed in the perspectives that PE had towards the amount of the financial support that they received, such that, South Korean teachers received the most amount of funding, and all three teachers seemed satisfied with their administrative support. Similar to South Korea, Japanese PE teachers were satisfied with their funding support despite the small amount of monetary support. On the other hand, U.S. teachers were actively looking for external funding to support their PE programs and seemed dissatisfied with their current funding situation.

In this study, our participants’ teaching experiences were in wide-range from early career to late career. Given 44% of new teachers in U.S. leave the profession within the first 5 years of their teaching career (Ingersoll et al., 2018), and the percentage of teachers leaving the profession has steadily increased since 1988 (Goldring et al., 2014). There is the specific need to focus independently on the earlier career (pre-service to first five years) PE teachers to better understand the gap that exists between their expectations for their profession from pre-service learning phase to early-career phase (e.g., realization of additional job duties and responsibilities). Based on Locke (1976 as cited in Ulrickson, 1996)’s definition of job satisfaction, it may also be helpful to educate pre-service teachers on additional duties and responsibilities outside of teaching that come with the profession. As we voice the concerns of the secondary PE teachers of the U.S., it is best to not only re-examine the amount of workload, duties, and responsibilities, but to also re-visit the evaluation procedure to encompass the areas that provide a sense of reward. In our context, it is especially recommended for the administrators to recognize the effort that is put in by each teacher to create an equitable PE learning environment that allows all students of all levels to feel part of the activity engaged during class. When there are professional development opportunities that are in line with projected professional goals, teachers in early career stage should be encouraged and supported by their principals and the district in which they serve. In terms of building a collegial work environment, as suggested by You and Conley (2015), perhaps implementing a mentoring program between the veteran teachers and early-career teachers may improve team efficacy that would lead to increased job satisfaction and reduced intention to leave among secondary teachers.

At last, it is warranted to examine the changes in administrative support, including funding, for the discipline after the implementation of ESSA in 2015 that replaced the No Child Left Behind. It brings hope that health and PE is now recognized as part of the “well-rounded education” in the U.S.; our next step is to communicate the empirical benefits of this very important academic subject to all educators for PE to be perceived as valuable and important part of growth and development of the youth today.

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