

Integrating Interactive Media for Social Connectedness at Urban Public Parks in Sustainable Smart Cities: A Systematic Review

Lum Huey Ying, Shureen Faris Abd. Shukor, Roziya Ibrahim,
Mohd Yazid Mohd Yunos

Department of Landscape Architecture, Faculty of Design and Architecture, Universiti Putra
Malaysia

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v14-i10/23979> DOI:10.6007/IJARBSS/v14-i10/23979

Published Date: 16 October 2024

Abstract

Youth park usage is low due to high levels of sedentary behaviour and a lack of attractive park elements. Such high sedentary behavior is causing deterioration of youths' well-being as more youths are losing their social connectedness. Therefore, there is a need to develop an urban public park for promoting health and well-being for youths. This study is part of a larger study in promoting youth physical activities by integrating interactive media technology at urban public park in Hong Kong. The purpose of this study is to identify urban public park features which could attract physical activities among youths. This article presents the results of a systematic literature review synthesis process on urban public park for youths. Results found nature, facilities, and programs are critical for attracting physical activities among youths. In addition, the parks could improve youth's well-being when their physical activities are supported by interactive media technologies experiences which are best integrated with engaging social connections. This study contributes in developing a proposed model for a Youth-connected Interactive Media Park. The proposed model is expected to lead to developing public urban parks that are attractive to youths hence could activate outdoor physical activities among youths. Future studies are recommended to investigate how tapping into smart city's technological interventions could make social connectedness through preferred park features by youths for their physical activities.

Keywords: Interactive Media Technology, Urban Public Park, Youth Health & Well-being, Social Connectedness

Background Study

The low usage of parks among youth can be attributed to the lack of attractive park elements and the prevalence of sedentary behavior. Youth sedentary behavior in smart cities presents numerous challenges that can significantly impact their overall well-being, including a notable

decline in social connectedness. To address these issues, there is a pressing need to develop urban public parks specifically designed to promote the health and well-being of youth. Urban public parks are essential for advancing people's health and wellbeing, especially for young people. According to Jerrett et al (2013) "smart growth" communities with walkability and green space is associated with increased physical activity in children. The built environment with a specific focus has a significant impact on public health as it provides opportunities for outdoor activities and health-related physical exercise.

Numerous investigations, such those carried out by Mak and Jim (2019), and Chow et al. (2016), have examined diverse facets of urban park users with the aim of enhancing urban park development and management. Additionally, Wray et al (2020), and Hunter et al. (2015), have highlighted the importance of outdoor spaces in providing opportunities for physical activity and social connectedness, particularly for the health of children and youth. Similarly, Edwards et al (2015), and Van Hecke et al (2018), have emphasized the inclusion of specific park features, elements, and public space qualities in urban parks. Moreover, Jansson et al (2019), have focused on applications that record and analyze physical activity, applicable to both indoor and outdoor settings. While adults are well-versed in the features that attract them to parks, limited knowledge exists regarding the specific elements that appeal to youth and encourage their use of particular parks.

Hence, considering that cities can have a detrimental influence on people's health, it becomes crucial to plan metropolitan environments that promote health and well-being. Parks are valuable assets within communities addressing the lack of comprehensive discussion on the factors influencing low usage of urban public parks among youth is crucial. It is important to prioritize research and initiatives aimed at understanding and enhancing the appeal of these parks for young people. By doing so, we can promote their physical activity and overall well-being, ultimately bridging the gap and developing effective solutions to address this issue.

Consequently, this study is part of a larger effort to promote youth physical activities through the integration of interactive media technology in urban public parks in Hong Kong. The purpose of this study is to identify urban public park features that enhancing their attractiveness thereby attracting more youth to engage in physical activities and improving the utilization of urban public parks specifically among young people.

Urban Public Park, Youth, and Physical Activities

This section presents the results of selected literature review on urban public park, youth, and attracts physical activities.

Urban Public Park

Wong & Domroes (2005), found that perceived scenic beauty in urban parks can indicate effective management. Additionally, Wong and Domroes (2004), examined how users perceive and utilize facilities in Kowloon Park. They emphasized the importance of addressing park management issues based on the users' perspective. This includes providing easy access, promoting optimal usage, and facilitating complementary environmental improvements. Similarly, Wong (2009), conducted a study examining the urban park-visiting behavior of Hong Kong residents. The author emphasized the need for Hong Kong to develop a comprehensive strategy for urban parks that can effectively meet the leisure needs of its citizens.

In line with these findings, Van Hecke et al (2018), conducted a systematic review on public open spaces and adolescent physical activity. The study found that trails, walking paths, adventure playgrounds, and specific sports fields positively influenced visitation and physical activity. Interestingly, aesthetics and safety were found to be less important. Moreover, the research method employed by Van Hecke et al (2018), can guide article screening and enhance data accuracy. Furthermore, Takemia et al (2010), found that for adults, the presence of a large, high-quality park within walking distance of their home is more important for promoting recreational walking and health benefits than the proximity of smaller open spaces. This aligns with the importance of park characteristics emphasized by other studies.

Reed and Hooker (2012), examined the activity settings and physical activity intensity of boys and girls in a southeastern community. Their findings aimed to provide objective data for developing user profiles and effective physical activity interventions in community park settings. Similarly, Mak and Jim (2019), stressed the significance of analyzing the characteristics and preferences of urban park users to enhance park planning. Their findings informed a comprehensive, community-sensitive strategy to improve urban parks, highlighting the relevance of objective research data for meeting residents' leisure and recreational needs. Additionally, Lachowycz and Jones (2012), developed a theoretical framework for understanding the relationship between greenspace and health. They emphasized that this relationship is influenced by demographic factors, living context, greenspace type, and climate. Similarly, Kaźmierczak (2012), found that well-maintained parks with good recreational facilities contribute to the development of social ties in inner-city neighborhoods. The characteristics of individuals and the neighborhood also play a significant role in fostering social interactions in these parks.

Moreover, Kaczynski et al (2012), developed a user-friendly tool, the Community Park Audit Tool (CPAT), to assess parks' potential for promoting physical activity. They found that the CPAT is reliable and can facilitate engagement from diverse stakeholders in evaluating and advocating for improved parks and healthy community design. Furthermore, Giles-Corti et al. (2016), underline the influence of city planning on population health, emphasizing the need for pedestrian-friendly and cycling-friendly networks to promote active travel and create safe, attractive neighborhoods. In a similar vein, Chang et al (2019), examined the spatial accessibility of urban parks for residents in public and private housing estates in Hong Kong. They found that differences in public transportation accessibility and connectivity contributed to spatial inequality in park accessibility between the two types of housing estates. Additionally, Chan et al (2015), emphasized that observing park managers' perceptions can guide future park management by identifying areas of change.

Furthermore, Wray et al (2020), emphasized the significance of physical activity and social connectedness in outdoor spaces for children and youth. The study highlighted that outdoor spaces offer opportunities for physical activity and social interaction, making them an ideal environment to address these important health concerns among children and youth. Similarly, Hoehner et al (2010), conducted interventions in National Parks to increase physical activity. They found that media exposure led to a 6% increase in awareness of physical activity importance and a 7% increase in active visits, supporting the use of program enhancements to improve public-health-recreation partnerships and promote physical activity. Lastly, Chow

et al (2016), emphasized the importance of public parks in high-density cities for promoting physical activity. They highlighted that studying park usage using SOPARC can provide valuable information to address population health needs, making it a suitable reference for future research.

These studies collectively contribute to the understanding of urban park management and user perspectives in urban park planning. Factors such as scenic beauty, accessibility, facility quality, and social interactions contribute to park utilization and health benefits. Comprehensive strategies, research data, and community engagement are crucial for improving urban public parks and promoting physical activity.

The studies mentioned have limitations or focus on different aspects compared to research on urban public open spaces, Chow et al (2016), examined user groups in public parks across but did not specifically target youth. Whilst, Van Hecke et al (2018), explored public open space characteristics among adolescents. Wray et al (2020), concentrated on outdoor spaces promoting physical activity and social connectedness for children and youth in general, while my aim is to develop urban public open space design guidelines incorporating interactive technology features to attract youth and increase their physical activities, potentially exploring vertical urban public open spaces. Hoehner et al (2010), focused on national park users rather than urban public open spaces, and their research did not specifically address the use of media and programs to increase physical activity among youth in urban public open spaces. Mak & Jim (2019), studied a wide range of urban park users to improve park planning and management. Based on the studies mentioned (Wong & Domroes, 2004; Wong & Domroes, 2009; Lachowycz & Jones, 2012; Wong & Domroes, 2005; Kaźmierczak, 2012; Chiesura, 2003; Reed & Hooker, 2012; Chang et al., 2019; Kaczynski et al., 2012; Takemia et al., 2010; Chan et al., 2015; Giles-Corti et al., 2016) do not directly address the specific focus of research on urban public park and youth.

The study aims to create an attractive park in sustainable compact cities, focusing on reducing environmental, social, and behavioral risk factors prioritizing health and reducing health inequities, based on Giles-Corti et al. (2016). It will specifically focus on high-quality park features for youth, as identified by Takemia et al. (2010), and explore the associations between park quality, visit characteristics, and social ties in the neighborhood, especially for youth, as suggested by Kaźmierczak (2012). The study agrees with Chow et al. (2016) on assessing the differential use of parks and specific facilities for youth physical activity.

Furthermore, the study aligns with Van Hecke et al. (2018) and Kaczynski et al. (2012) in recognizing that various characteristics of urban public open spaces (UPOS) positively influence park visitation and physical activity, particularly among youth. It aims to investigate the impact of urban park accessibility on youth visitation. Additionally, the study acknowledges the importance of community acceptance of new park features, as highlighted by (Chang et al., 2019).

To gather comprehensive data, the study includes a reality survey and seeks the opinions of youth, following (Lachowycz & Jones, 2012). It aims to develop a framework to inform research studies and enhance the understanding of the relationship between greenspace and health. The study also considers the perspectives of Wong (2009) and Chan et al. (2015) to

improve park planning, design, and management policies to better meet the needs of young users.

Analyzing youth preferences, affective appraisal, and cross-cultural perspectives, the study draws upon Wong & Domroes (2005). It explores how urban parks contribute to the physical well being of youth and investigates their needs beyond the park, such as in malls, as suggested by Chiesura (2003), and Reed & Hooker (2012).

Furthermore, the study agrees with Mak & Jim (2019) in establishing socio-demographic profiles of park users and evaluating visit-related preferences, particularly for youth in Kowloon urban public open spaces. It also recognizes the influence of media exposure, as highlighted by Hoehner et al. (2010), and considers integrating interactive media technology to attract youth. Inspired by Wray et al. (2020), the study emphasizes the role of outdoor spaces and social connectedness in addressing health concerns. It aims to develop an urban public open spaces (UPOS) design framework that incorporates interactive technology features.

Overall, this study aims to create an attractive park in sustainable compact cities, considering youth preferences, social ties, and the impact of urban park accessibility. It seeks to enhance the physical well being of youth, address health disparities, and promote the use of interactive technology in park design.

Youth

Dewa et al. (2021), emphasized the significance of improving the quality of the therapeutic relationship between clinicians and young people within digital interventions for youth mental health outcomes (specifically depression and anxiety). The study suggests that researchers and developers should focus on enhancing the quality of the clinician-youth relationship as a crucial factor in digital interventions aimed at improving mental health outcomes for individuals aged 14-24 years. Moreover, Ries et al. (2009), highlighted the importance of increasing awareness of park availability, improving perceptions of park quality, and utilizing social networks to promote park use and physical activity among urban youth. Edwards et al. (2015) found that attractive park features are associated with higher levels of park use among adolescents for physical activity, suggesting the incorporation of appealing features to enhance park attractiveness and encourage youth engagement.

Furthermore, Burgess et al. (1988), emphasized the importance of diverse natural settings and social facilities in urban areas, recognizing the potential of green spaces to enhance the quality of life. Almanza et al. (2012), found that increased exposure to green spaces is associated with higher levels of physical activity, particularly among residents in smart growth communities. Floyd et al. (2011), stressed the significance of social factors and design features in promoting physical activity in parks for children and adolescents. Yuen et al. (2019) highlighted the impact of green spaces and accessibility on physical activity and healthy diets in compact urban areas. Moreover, Lo and Jim (2010) emphasized the need for green space planning and community involvement in public policies to meet diverse expectations and enhance recreational use.

Additionally, Crawford et al. (2007) investigated the relationship between neighborhood socioeconomic status and features of public open spaces (POS) that influence children's physical activity. They found that POS in high socioeconomic neighborhoods tend to have more features promoting physical activity among children. Timperio et al. (2008) discovered certain features of POS associated with participants' moderate-to-vigorous physical activity (MVPA), highlighting the importance of POS features in promoting physical activity among children. Moreover, Ding et al. (2011) explored the relationship between environmental attributes and physical activity in youth, identifying significant correlates such as walkability, traffic speed/volume, access to recreation facilities, land-use mix, and residential density. These findings have implications for policy and environmental interventions to promote active lifestyles in young people.

Furthermore, Deborah et al. (2009) emphasized considering multiple factors when implementing policies and programs for new recreational facilities, including facility quality, programming, staffing, fees, hours of operation, marketing, and outreach. Their insights contribute to creating effective and successful recreational facilities by addressing various human factors and optimizing user experience. Additionally, Vaughan et al. (2013) examined income and race-based disparities in park availability, features, and quality, emphasizing the need to address policies that contribute to these disparities, especially in low-income and high-minority areas, to rectify inequities in park access and quality.

According to Mak and Jim (2017) emphasize the significance of fear-evoking factors in urban parks for effective planning and management in Hong Kong. Their research provides valuable cross-cultural insights and suggests diverse factors that can be modified to enhance park safety. Understanding citizens' attitudes towards urban parks and green spaces is crucial for urban sustainability. Young-Chang and Keun-Ho (2015) conducted a study in Gyeongsan City, Republic of Korea, highlighting the importance of considering citizens' needs and attitudes to inform future directions for urban sustainability and improve overall quality of life.

Boone-Heinonen et al. (2010) stress the need to consider neighborhood characteristics and population subgroups when examining the relationship between the built environment and physical activity. They emphasize the importance of policy recommendations and further research to address these factors. Chen et al. (2022) focus on the impact of the built environment on functional capability in older adults, emphasizing sustainable and age-friendly urban planning as a means to support the public health of older adults.

Tucker et al. (2008) explore environmental influences on physical activity levels in youth, highlighting the importance of improving access to recreational opportunities to promote healthy levels of physical activity. Finally, Potwarka et al. (2008) investigate the relationship between park space, facilities, and healthy weight status among youth. They suggest that specific park facilities may have a greater impact on promoting physical activity and healthy weight status in children compared to the overall availability of park space. These studies collectively contribute to our understanding of factors that can be modified to enhance park safety, urban sustainability, and public health outcomes in various populations.

Baran et al. (2014) and Zhang, Zhang, Lai, and Kwan (2022), both studied the relationship between park use and neighborhood characteristics. Baran et al. found that park use was

influenced by factors such as park size, availability of activity settings, and neighborhood safety and poverty levels. Similarly, Zhang et al. emphasized the influence of neighborhood socioeconomic status on the relationship between park and neighborhood environments and park-based physical activity. Babey et al. (2008) and Sandu et al. (2018) both examined the factors influencing physical activity among specific age groups. Babey et al. focused on urban adolescents and highlighted the significance of park access and other sociodemographic and neighborhood factors. Sandu et al., conducted in Romania, emphasized the impact of environmental factors and personal motivations on youth physical activity.

Özgüner and Kendle (2004), and Veitch, Ball, Flowers, Deforche, and Timperio (2020) both explored the preferences and attitudes of the public, including children, towards different types of green spaces. Özgüner and Kendle found that the public had preferences for both naturalistic and formal green spaces, with design styles influencing these preferences. Similarly, Veitch et al. emphasized the importance of incorporating children's perspectives in park design to enhance their park experiences and promote health and social interaction.

Wan, Shen, and Choi (2020) investigated the effects of physical and psychological factors on users' attitudes, use patterns, and perceived benefits of urban parks. They stressed the importance of considering various factors within parks and their impact on health-related benefits. Similarly, Gallerani et al. (2016) explored youth experiences in conducting park audits, emphasizing their significance for community health promotion and individual well-being in urban public spaces. These studies highlight the importance of understanding user perspectives, considering diverse factors, and fostering civic engagement to enhance the positive effects of parks on health and community well-being.

Matthews et al. (2008) found a link between sedentary behaviors and negative health outcomes, indicating their prevalence among Americans. Epstein et al. (2006) revealed that greater access to parks is associated with increased physical activity and reduced sedentary behaviors among youth. Motomura et al. (2022) emphasized the importance of urban design guidelines to promote active lifestyles in densely populated urban areas through public open space redesign. Thorp et al. (2011) highlighted sedentary behavior as a significant risk factor for adverse health outcomes in adults, independent of physical activity. Together, these studies underscore the need to address sedentary behaviors and promote physical activity through environmental interventions and public open space planning.

The studies emphasize the importance of diverse natural settings, social facilities, and green spaces in urban areas. These spaces enhance quality of life, promote physical activity, and meet community needs. Factors like neighborhood characteristics, population subgroups, and age groups should be considered when examining the relationship between the built environment and physical activity outcomes. Understanding the role of the built environment and public preferences helps policymakers and urban planners design interventions and create supportive environments that promote physical activity and improve well-being. Addressing sedentary behaviors through environmental interventions and public open space planning is crucial. Overall, these findings highlight the significance of nature, community facilities, and thoughtful urban planning in promoting physical activity and enhancing community well-being.

Moreover, the studies mentioned have limitations or focus on different aspects compared to the research on urban public open spaces and youth. Gallerani et al. (2016) focused on civic engagement in community-based projects, while Zainol & Au-Yong (2016) only explored youth preferences at the park without considering park features that increase attractiveness. Sandu et al. (2018) focused on environmental attributes without addressing park features or youth physical activity. Veitch et al. (2020) examined children's perspectives rather than youth perspectives. Thorp et al. (2011) and Epstein et al. (2006) studied sedentary behavior in adults and children, not specifically youth behaviors. Matthews et al. (2008) studied sedentary behavior in the general US population, while Motomura et al. (2022) did not suggest park redesign strategies for physical activity. Özgüner & Kendle (2004) focused on public perceptions, while Potwarka et al. (2008) emphasized playgrounds instead of technology interventions. Burgess et al. (1988) discussed park value without providing solutions to increase it, and Baran et al. (2014) measured park use without suggesting how to increase it. Floyd et al. (2011) studied park use without considering technology integration, Babey et al. (2008) examined park safety and access. Other studies focused on different populations or factors, such as fear-evoking factors, park resources' distribution, or parental perceptions. Although these studies contribute to the understanding of various aspects related to parks, they do not specifically address technology integration or provide suggestions to enhance youth attractiveness and physical activity.

This study aims to provide a comprehensive analysis of the impact of technology and park features on youth physical activity, well-being, and park preferences. The research draws upon various references in the field to support its findings. A meta-analysis conducted by Dewa et al. (2021) highlighted the role of sustained quality social connection through digital interventions in increasing youth physical activity levels. This emphasizes the importance of utilizing technology to foster social connections that promote active lifestyles among youth. Ries et al. (2009) and Edwards et al. (2015) explored how technology interventions can raise awareness of park availability, improve perceptions of park quality, and utilize social networks, including interactive media technology. This suggests that incorporating technology into park settings can enhance youth engagement and encourage physical activity. To optimize urban spaces and promote youth health, the study references Almanza et al. (2012), Floyd et al. (2011), Yuen et al. (2019), Burgess et al. (1988), and Lo & Jim (2010). These studies examined the creation of high-physical-level urban parks, youth willingness to pay for park features, and the importance of a smart growth community. By considering these factors, urban parks can be designed to maximize their appeal to youth and facilitate physical activity.

Maximizing amenities and park features is crucial to attracting more youth to visit and engage in physical activity within parks. Crawford et al. (2007) and Timperio et al. (2008) emphasized the significance of incorporating interactive media technology and other features that appeal to youth. By providing engaging and interactive elements, parks can become more attractive and encourage youth to participate in physical activities. The study also explores the relationship between technology intervention, ecosystem services, green infrastructure, pocket parks, quality of life, and urban green spaces for youth, citing the work of Young-Chang & Keun-Ho (2015). Understanding the connections between these elements can inform the design and management of urban parks to better cater to the needs and preferences of youth.

Park management and design considerations are also important factors in promoting youth engagement and physical activity. Mak & Jim (2017) focused on park disamenities and perceived safety, highlighting the need for well maintained, safe, and inviting park environments that make youth feel comfortable and secure. The effects of residence characteristics, demography, ethnic group, income, and race on youth populations are explored by Vaughan et al. (2013). These factors influence the behaviors and preferences of youth, and understanding them can help tailor park features and interventions to specific communities. Investigating policy, program, and environmental changes aimed at attracting youth to urban public parks is important for increasing their utilization. Ding et al. (2011) examined the impact of such changes, while Deborah et al. (2009) explored the behaviors and limitations that may discourage youth from visiting parks. By addressing these barriers, parks can become more welcoming and appealing to youth.

In summary, this study synthesizes a wide range of research and literature to examine the impact of technology and park features on youth physical activity, well-being, and park preferences. The cited references provide valuable insights into various aspects of the topic, contributing to a comprehensive analysis of the subject matter. By considering these factors, urban parks can be designed and managed in a way that maximizes their appeal to youth and promotes their physical activity levels and overall well-being.

Physical activities level

Marquet et al. (2017) found that Pokémon GO had uneven effects on physical activity levels among young adults. While it could be a useful tool for health promotion under specific circumstances, its impact varied among players. Khamzina et al. (2019) conducted a systematic review and found that playing Pokémon GO was associated with a modest increase in daily steps taken among players. This suggests that incorporating exercise into mobile games can influence behavior change and promote physical activity. Both studies highlight the potential of Pokémon GO and similar mobile games to positively influence physical activity levels, especially among young adults. Moreover, they suggest that gamification and augmented reality features can be effective strategies for promoting health and encouraging individuals to engage in regular physical activity.

Huang et al. (2019) conducted a study on physical activity levels and sedentary behaviors among children and youth in Hong Kong, revealing low physical activity and fitness levels. This highlights the need for interventions to address these issues. To address this, Sallis et al. (2000) emphasized the importance of understanding factors influencing physical activity to design effective interventions, identifying variables such as sex, ethnicity, and social support. Additionally, Spengler et al. (2011) examined park-based physical activity among children, identifying modifiable features like playgrounds and courts. Fetter et al. (2020) showed that integrating technology into physical activity curriculum improved knowledge among youth. In line with this, Beets et al. (2016) proposed the Theory of Expanded, Extended, and Enhanced Opportunities (TEO) to target youth physical activity behaviors effectively. These findings support the use of technology-enhanced interventions and the TEO framework for promoting youth physical activity.

Botchwey et al. (2018) conducted research on youth physical activity in communities at higher risk for inactive lifestyles and childhood obesity. Their study identified important research

studies to promote healthy weight and physical activity among at-risk youth in urban and rural areas, contributing to the goal of equitable access to physical activities for youth. Similarly, Shuba & Shuba (2017) emphasized the importance of considering various factors when developing fitness technology for student youth, providing valuable insights for designing physical activity interventions. Furthermore, Aubert et al. (2018) developed the Global Matrix 3.0 of Report Card grades on physical activity, highlighting the need for public investments in effective interventions. In line with this, Rainham et al. (2012) investigated the intensity and location of physical activity among youth, emphasizing the role of the built environment and suggesting the use of actimetry and GPS data for a better understanding of activity patterns.

Navarra et al. (2021) investigated the use of digital media as a strategy to promote physical activity among school-age children, suggesting that it can be effective in countering sedentary lifestyles. Adding to this, Elsayed & Ashrry (2020) highlighted the emergence of Smart Parks, emphasizing the importance of performance measurement criteria and smart governance for improved park functionality. Additionally, Jansson et al. (2019) introduced the "ecofit" intervention, utilizing outdoor exercise equipment, social support, and smartphone technology to enhance community-based physical activity. Furthermore, Jerrett et al. (2013) found that living in "smart growth" communities with walkability and green space is associated with increased physical activity in children. Moreover, Giles-Corti & Donovan (2002) emphasized the importance of creating streetscapes that encourage walking for recreation and transportation in promoting physical activity.

Duan et al. (2018) emphasized the optimization of physical activity areas in parks to enhance elderly physical activity and health in Chinese and German cities. Similarly, Poh-Chin.Lai & Low (2019) highlighted the importance of prioritizing quality standards, such as openness and safety, when designing play spaces in densely populated cities. Building on this, Hunter et al. (2014) found that combining physical activity programs with changes to the built environment in urban green spaces shows potential for improving public health. These studies contribute to understanding the importance of designing and optimizing spaces to promote physical activity among different populations, including the elderly and children, and highlight the potential of interventions that consider both the physical and social environment to encourage active lifestyles.

Cohen et al. (2006) found that proximity to parks and recreational facilities is a significant predictor of physical activity in adolescent girls. Moreover, McCormack et al. (2022) highlighted the importance of considering the built environment when designing physical activity interventions, as it can either enhance or constrain their effectiveness. Additionally, Kaczynski et al. (2007) reviewed the relationship between parks, recreation settings, and physical activity, noting mixed associations with different types of parks or recreation facilities, but generally observing increased physical activity with proximity to parks. Furthermore, Cohen et al. (2007) emphasized the role of public parks as valuable resources for physical activity, particularly in minority communities, and highlighted the importance of park number and location in serving local populations and promoting physical activity.

The research that are being addressed emphasise how important it is to use specialised strategies to encourage physical activity among various communities. Particularly for young individuals, Pokémon GO and related smartphone games may have a beneficial effect on

physical activity levels. Factors such as sex, ethnicity, social support, and environmental features like playgrounds and courts should be considered when designing interventions for children and youth. Integrating technology into physical activity curriculum and utilizing frameworks like the Theory of Expanded, Extended, and Enhanced Opportunities (TEO) show promise in promoting youth physical activity. Research emphasizes the need for equity and considering various factors when targeting at-risk communities. Digital media, Smart Parks, outdoor exercise equipment, and walkable communities can effectively promote physical activity among children and school-age youth. Optimizing physical activity areas in parks, prioritizing quality standards in densely populated cities, and combining physical activity programs with changes to the built environment in urban green spaces are strategies that can enhance physical activity among different populations. The proximity of parks and recreational facilities plays a significant role in promoting physical activity, and the design and location of parks are crucial for serving local populations. The studies above have different focuses and limitations, highlighting the unique contributions of my research on urban public park, youth, and the technology intervention with park features to increase physical activities among youth.

The study aims to explore the impact of technology interventions and public investment on modifying Public Park features for youth (Spengler et al., 2011). It seeks to understand the relationship between residence characteristics, urban health, youth attitudes towards health, and physical activity (Cohen et al., 2007). The study aims to identify opportunities for future research in parks, recreation, and active living (Kaczynski et al., 2007). It recognizes the importance of technology and social support in promoting community-based physical activity among youth in urban public park (Jansson et al., 2019). The study recommends physical changes in urban areas to improve public health through interactive media technology park features (Hunter et al., 2014). It focuses on investigating specific park features associated with youth physical activity and optimizing the functioning of physical activity areas (Cohen et al., 2006; Duan et al., 2018). The study also examines the contribution of residential locations, shopping centers, and green spaces to youth physical activity (Rainham et al., 2012). It supports the integration of interactive media technology in urban public park to enhance youth performance and physical activity (Elsayed & Ashrry, 2020; Navarra et al., 2021). Furthermore, the study emphasizes public investment in park features that promote physical activities for youth (Aubert et al., 2018) and explores the integration of interactive media technology, such as reality games, with physical activity park features (Khamzina et al., 2019; Shuba & Shuba, 2017). Overall, the study aims to develop theories and interventions to enhance youth physical activity, address sedentary behavior, and improve youth health outcomes (Botchwey et al., 2018; Huang et al., 2019).

Overall, the studies explore the impact of technology interventions and public investment on modifying public park features for youth. The aim is enhance physical activity, addressing sedentary behavior and improve health outcomes through interactive media technology and optimized park design.

Method

The literature review in this paper follows the "systematic literature review synthesis process" (Masiran, R., et al. 2019; Luo, et al. 2022; Zou, et al. 2023). This process is an independent type of literature review (Rousseau, D. M., Manning, J., Denyer, D 2008; Yu Xiao, Maria

Watson 2019; Templier and Paré 2015) to determine the background theoretical context through an understanding of selected existing literature in the early research conceptualization phase. This study used Ibrahim's research question (RQ) construct classification technique to identify three different RQ constructs, namely the "WHO" (the element impacted by the research), "WHAT" (the information needed to solve the problem), and "HOW" (the targeted impact of the study), in formulating the primary research questions (Ibrahim 2008; Ibrahim, 2011 & 2020).

Based on the study's objective, a bibliographic search was conducted in SCOPUS, and Google Scholar databases with these keywords: *urban public park, youth, and attracts physical activities*. A total of 72 articles and 72 abstract were selected after title and abstract reviews. The abstracts of the selected journals were later reviewed in terms of their main content and conclusions, how their works would support future research, and what areas would need strengthening. The 72 abstracts were selected for detailed review before being assigned to specific sub-themes according to the importance of their existence. Then, the article discusses the cross-analysis, integrated possibilities, and prioritizes the synthesized information gearing towards a high probable theoretical proposition that could satisfy need to develop urban public park design. The systematic literature review synthesis process was documented using the online EAGLE System.

Discussions & Conclusions

This section shall cross-analyses the results from the earlier literature review above on urban public park, youth quality, and physical activities. Results found designers could create youth-focused parks by prioritizing health, social connections, accessibility, and integrating technology for physical activity and engagement. In addition, results found youth well-being can be enhanced through physical activities if these activities are integrated with technology and preferred park features. These would attract them to engage in interactive media within the park. Hence, this study finds that parks must be attractive for youths if the parks were to be used for the youths' physical activities. This study would like to propose that these parks are supported by interactive media technologies' experiences that could nurture engaging social connections. Figure 1 is the Point of Departure (POD) Tree Diagram for Youth-connected interactive media park. Figure 2 illustrates the proposed conceptual framework for the Youth-connected interactive media.

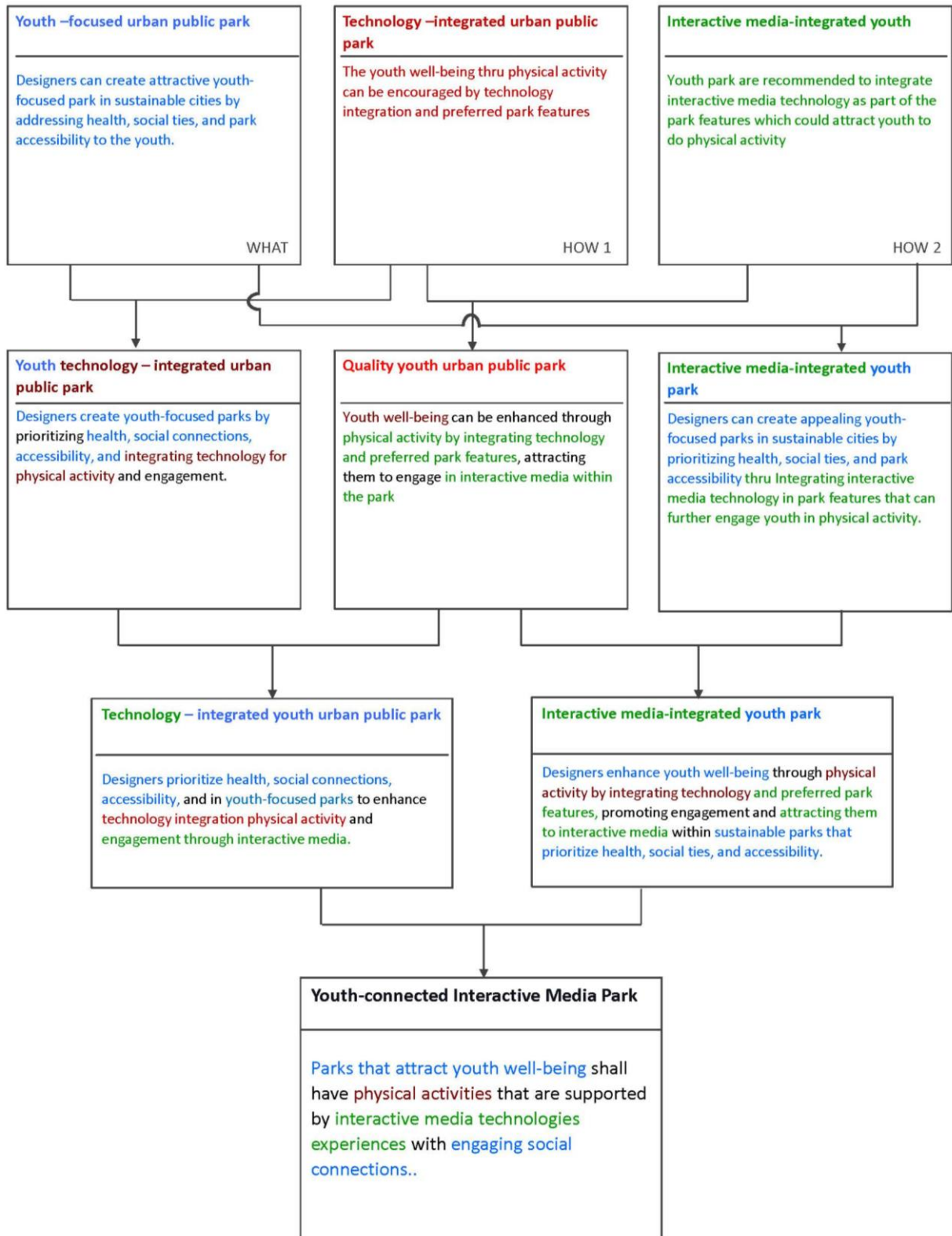


Figure 1 is the Point of Departure (POD) Tree Diagram for Youth-connected interactive media park. (Ying, 2024)

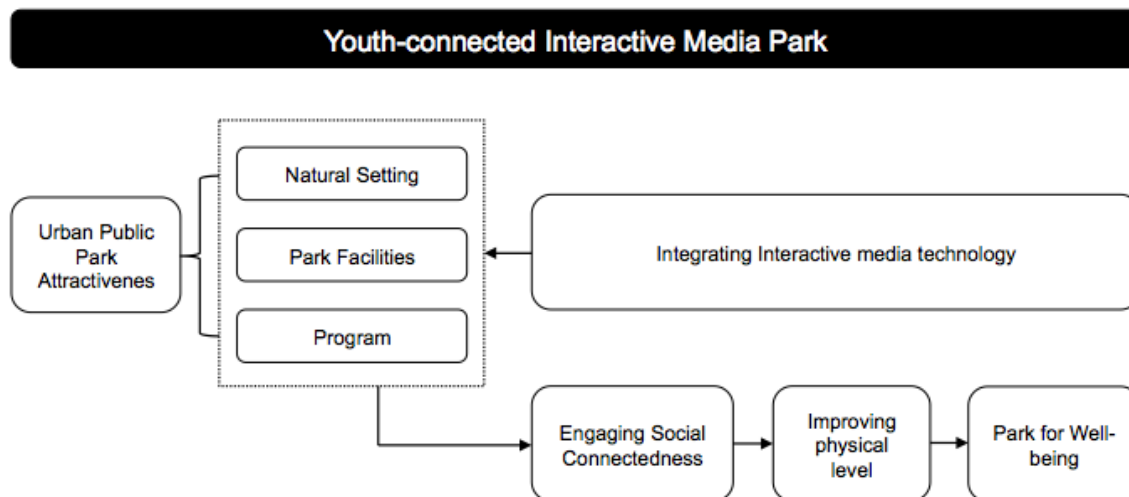


Figure 2: Illustrates the proposed conceptual framework for the Youth-connected interactive media (Ying, 2024)

In conclusion, this review paper postulated the urban public park features—such as nature setting, park facilities, and programs—for attracting physical activities among youths. Results found parks that could attract youth well-being shall have physical activities that are supported by interactive media technologies experiences. The best way to incorporate such experiences is with interesting social relationships. Such experiences are best integrated with engaging social connections. This study contributes in developing a model for a Youth-connected Interactive Media Park. The proposed model is expected to lead to developing urban public parks that are attractive to youths hence could improve the well-being among youths.

This research aims to contribute to the scholarly understanding of the factors that influence the low park usage observed among young individuals, while concurrently proposing urban public park designs that prioritize the promotion of youth wellness. By conducting a thorough examination of park characteristics that effectively capture the attention of youth and exploring potential interventions to augment park usage, this study seeks to bridge existing knowledge gaps in the field. Ultimately, the overarching objective is to develop an Urban Public Park design (UPP) that is specifically tailored to foster the well-being of young individuals. Therefore, this study aims to improve urban public parks' general attractiveness and usage, which will benefit young people living in urban areas in terms of wellness. Future studies are recommended to investigate how tapping into smart city's technological interventions could make social connectedness through preferred park features by youths for their physical activities.

The increasing prevalence of technology in daily life presents a unique opportunity to enhance social connectedness in urban public parks. By leveraging interactive media, this research aims to address the challenges of low park usage among young individuals. Engaging digital tools can create immersive experiences that not only attract youth but also foster community interactions and promote physical activity. The integration of technology in park design is not

just about modernization; it represents a crucial step toward creating inclusive environments that resonate with the interests and needs of younger generations.

References

- Ibrahim, R. (2011). "Demistifying the Arduous Doctoral Journey: The EAGLE Vision of a Research Proposal", *The Electronic Journal of Business Methods*, vol.9(2), 2011:130-140.
- Ibrahim, R. (2008). "Setting Up a Research Question for Determining the Research Methodology", *Alam Cipta Intl.J on Sustainable Tropical Design Research and Practice*, vol.3(1), 2008:69-72.
- Chow, B., McKenzie, T., & Sit, C. (2016). Public Parks in Hong Kong: Characteristics of Physical Activity Areas and Their Users. *International Journal of Environmental Research and Public Health*, 13(7), 639. <https://doi.org/10.3390/ijerph13070639>
- Van Hecke, L., Ghekiere, A., Veitch, J., Van Dyck, D., Van Cauwenberg, J., Clarys, P., & Deforche, B. (2018). Public open space characteristics influencing adolescents' use and physical activity: A systematic literature review of qualitative and quantitative studies. *Health & Place*, 51, 158–173. <https://doi.org/10.1016/j.healthplace.2018.03.008>
- Wray, A., Martin, G., Ostermeier, E., Medeiros, A., Little, M., Reilly, K., & Gilliland, J. (2020). Physical activity and social connectedness interventions in outdoor spaces among children and youth: a rapid review. *Health Promotion and Chronic Disease Prevention in Canada*, 40(4), 104–115. <https://doi.org/10.24095/hpcdp.40.4.02>
- Hoehner, C. M., Brownson, R. C., Allen, D., Gramann, J., Behrens, T. K., Floyd, M. F., Leahy, J., Liddle, J. B., Smaldone, D., Spain, D. D., Tardona, D. R., Ruthmann, N. P., Seiler, R. L., & Yount, B. W. (2010b). Parks Promoting Physical Activity: Synthesis of Findings From Interventions in Seven National Parks. *Journal of Physical Activity and Health*, 7(s1), S67–S81. <https://doi.org/10.1123/jpah.7.s1.s67>
- Mak, B. K., & Jim, C. (2019). Linking park users' socio-demographic characteristics and visit-related preferences to improve urban parks. *Cities*, 92, 97–111. <https://doi.org/10.1016/j.cities.2019.03.008>
- Wong, K. K. K., & Domroes, M. (2004). Users' perception of kowloon park, Hong Kong: Visiting patterns and scenic aspects. *Chinese Geographical Science*, 14(3), 269–275. <https://doi.org/10.1007/s11769-003-0058-8>
- Wong, K. K. K. (2009). Urban park visiting habits and leisure activities of residents in Hong Kong, China. *Managing Leisure*, 14(2), 125–140. <https://doi.org/10.1080/13606710902752653>
- Lachowycz, K., & Jones, A. P. (2013). Towards a better understanding of the relationship between greenspace and health: Development of a theoretical framework. *Landscape and Urban Planning*, 118, 62–69. <https://doi.org/10.1016/j.landurbplan.2012.10.012>
- Wong, K. K., & Domroes, M. (2005). The Visual Quality of Urban Park Scenes of Kowloon Park, Hong Kong: Likeability, Affective Appraisal, and Cross-Cultural Perspectives. *Environment and Planning B Planning and Design*, 32(4), 617–632. <https://doi.org/10.1068/b31028>
- Kazmierczak, A. (2013). The contribution of local parks to neighbourhood social ties. *Landscape and Urban Planning*, 109(1), 31–44. <https://doi.org/10.1016/j.landurbplan.2012.05.007>

- Chiesura, A. (2003). The role of urban parks for the sustainable city. *Landscape and Urban Planning*, 68(1), 129-138. [https://doi.org/10.1016/S0169-2046\(03\)00029-8](https://doi.org/10.1016/S0169-2046(03)00029-8)
- Reed, J. A., & Hooker, S. P. (2012). Where Are Youth Physically Active? A Descriptive Examination of 45 Parks in a Southeastern Community. *Childhood Obesity*, 8(2), 124–131. <https://doi.org/10.1089/chi.2011.0040>
- Gong, Y., Gallacher, J., Palmer, S., & Fone, D. (2019). Public transportation and the spatial inequality of urban park accessibility: New evidence from Hong Kong. *Transportation Research Part D: Transport and Environment*, 76, 104-115. <https://doi.org/10.1016/j.trd.2019.09.011>
- Kaczynski, A. T., Stanis, S. A., & Besenyi, G. M. (2012). Development and Testing of a Community Stakeholder Park Audit Tool. *American Journal of Preventive Medicine*, 42(3), 242-249. <https://doi.org/10.1016/j.amepre.2011.10.018>
- Sugiyama, T., Francis, J., Middleton, N. J., Owen, N., & Giles-Corti, B. (2010). Associations Between Recreational Walking and Attractiveness, Size, and Proximity of Neighborhood Open Spaces. *American Journal of Public Health*, 100(9), 1752–1757. <https://doi.org/10.2105/ajph.2009.182006>
- Chan, C. S., Marafa, L. M., & Van Den Bosch, C. C. K. (2014). Changing perspectives in urban park management: a longitudinal study of Hong Kong. *Managing Leisure*, 1–21. <https://doi.org/10.1080/13606719.2014.944411>
- Giles-Corti, B., Vernez-Moudon, A., Reis, R., Turrell, G., Dannenberg, A. L., Badland, H., Foster, S., Lowe, M., Sallis, J. F., Stevenson, M., & Owen, N. (2016). City planning and population health: a global challenge. *The Lancet*, 388(10062), 2912-2924. [https://doi.org/10.1016/S0140-6736\(16\)30066-6](https://doi.org/10.1016/S0140-6736(16)30066-6)
- Gallerani, D. G., Besenyi, G. M., Stanis, S. A., & Kaczynski, A. T. (2016). "We actually care and we want to make the parks better": A qualitative study of youth experiences and perceptions after conducting park audits. *Preventive Medicine*, 95, S132-S138. <https://doi.org/10.1016/j.ypmed.2016.08.028>
- Zainol, R., & Au-Yong, C. P. (2016). WHAT BRINGS YOUTH TO RECREATIONAL PARKS? PLANNING MALAYSIA, 14(5). <https://doi.org/10.21837/pmjournal.v14.i5.184>
- Sandu, P., Chereches, R. M., Baba, C. O., Revnic, R. N., Mocean, F., & S, P. (2018). Environmental influences on physical activity – Romanian youths' perspectives. *Children and Youth Services Review*, 95, 68-74. <https://doi.org/10.1016/j.childyouth.2018.10.028>
- Veitch, J., Ball, K., Flowers, E., Deforche, B., & Timperio, A. (2021). Children's ratings of park features that encourage park visitation, physical activity and social interaction. *Urban Forestry & Urban Greening*, 58, 126963. <https://doi.org/10.1016/j.ufug.2020.126963>
- Thorp, A. A., Owen, N., Neuhaus, M., & Dunstan, D. W. (2011). Sedentary Behaviors and Subsequent Health Outcomes in Adults: A Systematic Review of Longitudinal Studies, 1996–2011. *American Journal of Preventive Medicine*, 41(1), 207-215. <https://doi.org/10.1016/j.amepre.2011.05.004>
- Epstein, L. H., Raja, S., Gold, S. S., Paluch, R. A., Pak, J., & Roemmich, J. N. (2006). Reducing sedentary behavior: The relationship between park area and the physical activity of youth. *Psychological Science*, 17(1), 654-659. <https://doi.org/10.1111/j.1467-9280.2006.01761.x>
- Matthews, C. E., Chen, K. Y., Freedson, P. S., Buchowski, M. S., Beech, B. M., Pate, R. R., & Troiano, R. P. (2008). Amount of Time Spent in Sedentary Behaviors in the United

- States, 2003-2004. *American Journal of Epidemiology*, 167(7), 875–881. <https://doi.org/10.1093/aje/kwm390>
- Motomura, M., Koohsari, M. J., Lin, C. Y., Ishii, K., Shibata, A., Nakaya, T., Kaczynski, A. T., Veitch, J., & Oka, K. (2022). Associations of public open space attributes with active and sedentary behaviors in dense urban areas: A systematic review of observational studies. *Health & Place*, 75, 102816. <https://doi.org/10.1016/j.healthplace.2022.102816>
- Özgüner, H., & Kendle, A. (2006). Public attitudes towards naturalistic versus designed landscapes in the city of Sheffield (UK). *Landscape and Urban Planning*, 74(2), 139–157. <https://doi.org/10.1016/j.landurbplan.2004.10.003>
- Potwarka, L. R., Kaczynski, A. T., & Flack, A. L. (2008). Places to Play: Association of Park Space and Facilities with Healthy Weight Status among Children. *Journal of Community Health*, 33(5), 344–350. <https://doi.org/10.1007/s10900-008-9104-x>
- Burgess, J., Harrison, C. M., & Limb, M. (1988). People, Parks and the Urban Green: A Study of Popular Meanings and Values for Open Spaces in the City. *Urban Studies*, 25(6), 455–473. <https://doi.org/10.1080/00420988820080631>
- Baran, P. K., Smith, W. R., Moore, R. C., Floyd, M. F., Bocarro, J. N., Cosco, N. G., & Danninger, T. M. (2013). Park Use Among Youth and Adults. *Environment and Behavior*, 46(6), 768–800. <https://doi.org/10.1177/0013916512470134>
- Floyd, M. F., Bocarro, J. N., Smith, W. R., Baran, P. K., Moore, R. C., Cosco, N. G., Edwards, M. B., Suau, L. J., & Fang, K. (2011). Park-Based Physical Activity Among Children and Adolescents. *American Journal of Preventive Medicine*, 41(3), 258–265. <https://doi.org/10.1016/j.amepre.2011.04.013>
- Babey, S. H., Hastert, T. A., Yu, H., & Brown, E. R. (2008). Physical Activity Among Adolescents. *American Journal of Preventive Medicine*, 34(4), 345–348. <https://doi.org/10.1016/j.amepre.2008.01.020>
- Lo, A. Y., & Jim, C. (2010). Willingness of residents to pay and motives for conservation of urban green spaces in the compact city of Hong Kong. *Urban Forestry & Urban Greening*, 9(2), 113–120. <https://doi.org/10.1016/j.ufug.2010.01.001>
- Boone-Heinonen, J., Popkin, B. M., Song, Y., & Gordon-Larsen, P. (2010). What neighborhood area captures built environment features related to adolescent physical activity? *Health & Place*, 16(6), 1280–1286. <https://doi.org/10.1016/j.healthplace.2010.06.015>
- Chen, S., Bao, Z., Chen, J., Yang, L., & Lou, V. (2022). Sustainable built environment for facilitating public health of older adults: Evidence from Hong Kong. *Sustainable Development*, 30(5), 1086–1098. <https://doi.org/10.1002/sd.2303>
- Edwards, N., Hooper, P., Knuiaman, M., Foster, S., & Giles-Corti, B. (2015). Associations between park features and adolescent park use for physical activity. *International Journal of Behavioral Nutrition and Physical Activity*, 12(1). <https://doi.org/10.1186/s12966-015-0178-4>
- Yuen, J. W. M., Chang, K. K. P., Wong, F. K. Y., Wong, F. Y., Siu, J. Y. M., Ho, H. C., Wong, M. S., Ho, J. Y. S., Chan, K. L., & Yang, L. (2019). Influence of Urban Green Space and Facility Accessibility on Exercise and Healthy Diet in Hong Kong. *International Journal of Environmental Research and Public Health*, 16(9), 1514. <https://doi.org/10.3390/ijerph16091514>
- Zhang, R., Zhang, C. Q., Lai, P. C., & Kwan, M. P. (2022). Park and neighbourhood environmental characteristics associated with park-based physical activity among

- children in a high-density city. *Urban Forestry & Urban Greening*, 68, 127479. <https://doi.org/10.1016/j.ufug.2022.127479>
- Cohen, D. A., Sehgal, A., Williamson, S., Marsh, T., Golinelli, D., & McKenzie, T. L. (2009). New Recreational Facilities for the Young and the Old in Los Angeles: Policy and Programming Implications. *Journal of Public Health Policy*, 30(S1), S248–S263. <https://doi.org/10.1057/jphp.2008.45>
- Ding, D., Sallis, J. F., Kerr, J., Lee, S., & Rosenberg, D. E. (2011). Neighborhood Environment and Physical Activity Among Youth. *American Journal of Preventive Medicine*, 41(4), 442–455. <https://doi.org/10.1016/j.amepre.2011.06.036>
- Vaughan, K. B., Kaczynski, A. T., Stanis, S. a. W., Besenyi, G. M., Bergstrom, R., & Heinrich, K. M. (2013). Exploring the Distribution of Park Availability, Features, and Quality Across Kansas City, Missouri by Income and Race/Ethnicity: an Environmental Justice Investigation. *Annals of Behavioral Medicine*, 45(S1), 28–38. <https://doi.org/10.1007/s12160-012-9425-y>
- Mak, B. K., & Jim, C. (2018). Examining fear-evoking factors in urban parks in Hong Kong. *Landscape and Urban Planning*, 171, 42–56. <https://doi.org/10.1016/j.landurbplan.2017.11.012>
- Timperio, A., Giles-Corti, B., Crawford, D., Andrianopoulos, N., Ball, K., Salmon, J., & Hume, C. (2008). Features of public open spaces and physical activity among children: Findings from the CLAN study. *Preventive Medicine*, 47(5), 514–518. <https://doi.org/10.1016/j.ypmed.2008.07.015>
- Tucker, P., Irwin, J. D., Gilliland, J., He, M., Larsen, K., & Hess, P. (2009). Environmental influences on physical activity levels in youth. *Health & Place*, 15(1), 357–363. <https://doi.org/10.1016/j.healthplace.2008.07.001>
- Wan, C., Shen, G. Q., & Choi, S. (2020). Effects of physical and psychological factors on users' attitudes, use patterns, and perceived benefits toward urban parks. *Urban Forestry & Urban Greening*, 51, 126691. <https://doi.org/10.1016/j.ufug.2020.126691>
- Lee, Y. C., & Kim, K. H. (2015). Attitudes of Citizens towards Urban Parks and Green Spaces for Urban Sustainability: The Case of Gyeongsan City, Republic of Korea. *Sustainability*, 7(7), 8240–8254. <https://doi.org/10.3390/su7078240>
- Crawford, D., Timperio, A., Giles-Corti, B., Ball, K., Hume, C., Roberts, R., Andrianopoulos, N., & Salmon, J. (2008). Do features of public open spaces vary according to neighbourhood socio-economic status? *Health & Place*, 14(4), 889–893. <https://doi.org/10.1016/j.healthplace.2007.11.002>
- Almanza, E., Jerrett, M., Dunton, G., Seto, E., & Pentz, M. A. (2012). A study of community design, greenness, and physical activity in children using satellite, GPS and accelerometer data. *Health & Place*, 18(1), 46–54. <https://doi.org/10.1016/j.healthplace.2011.09.003>
- Ries, A. V., Voorhees, C. C., Roche, K. M., Gittelsohn, J., Yan, A. F., & Astone, N. M. (2009). A Quantitative Examination of Park Characteristics Related to Park Use and Physical Activity Among Urban Youth. *Journal of Adolescent Health*, 45(3), S64–S70. <https://doi.org/10.1016/j.jadohealth.2009.04.020>
- Dewa, L. H., Lawrance, E., Roberts, L., Brooks-Hall, E., Ashrafian, H., Fontana, G., & Aylin, P. (2021). Quality Social Connection as an Active Ingredient in Digital Interventions for Young People With Depression and Anxiety: Systematic Scoping Review and Meta-analysis. *Journal of Medical Internet Research*, 23(12), e26584. <https://doi.org/10.2196/26584>

- Marquet, O., Alberico, C., & Hipp, A. J. (2018). Pokémon GO and physical activity among college students. A study using Ecological Momentary Assessment. *Computers in Human Behavior*, *81*, 215–222. <https://doi.org/10.1016/j.chb.2017.12.028>
- Huang, W. Y., Wong, S. H., Sit, C. H., Wong, M. C., Sum, R. K., Wong, S. W., & Yu, J. J. (2019). Results from the Hong Kong's 2018 report card on physical activity for children and youth. *Journal of Exercise Science & Fitness*, *17*(1), 14–19. <https://doi.org/10.1016/j.jesf.2018.10.003>
- Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine & Science in Sports & Exercise*, 963–975. <https://doi.org/10.1097/00005768-200005000-00014>
- Fetter, D. S., Linnell, J. D., Dharmar, M., Bergman, J. J., Byrnes, M., Gerdes, M. A., Ruiz, L. D., Pang, N., Pressman, J., & Scherr, R. E. (2020). Using Theory to Develop Healthy Choices in Motion, a Comprehensive, Experiential Physical Activity Curriculum. *Frontiers in Public Health*, *7*. <https://doi.org/10.3389/fpubh.2019.00421>
- Beets, M. W., Okely, A., Weaver, R. G., Webster, C., Lubans, D., Brusseau, T., Carson, R., & Cliff, D. P. (2016). The theory of expanded, extended, and enhanced opportunities for youth physical activity promotion. *International Journal of Behavioral Nutrition and Physical Activity*, *13*(1). <https://doi.org/10.1186/s12966-016-0442-2>
- Botchwey, N., Floyd, M. F., Porter, K. P., Cutter, C. L., Spoon, C., Schmid, T. L., Conway, T. L., Hipp, J. A., Kim, A. J., Meyer, M. R. U., Walker, A. L., Kauh, T. J., & Sallis, J. F. (2018). Policy and Practice-Relevant Youth Physical Activity Research Center Agenda. *Journal of Physical Activity and Health*, *15*(8), 626–634. <https://doi.org/10.1123/jpah.2017-0327>
- Shuba, L., & Shuba, V. (2017). Modernization of physical education of student youth. *Physical Education of Students*, *21*(6), 310. <https://doi.org/10.15561/20755279.2017.0608>
- Khamzina, M., Parab, K. V., An, R., Bullard, T., & Grigsby-Toussaint, D. S. (2020). Impact of Pokémon Go on Physical Activity: A Systematic Review and Meta-Analysis. *American Journal of Preventive Medicine*, *58*(2), 270–282. <https://doi.org/10.1016/j.amepre.2019.09.005>
- Aubert, S., Barnes, J. D., Abdeta, C., Nader, P. A., Adeniyi, A. F., Aguilar-Farias, N., Tenesaca, D. S. A., Bhawra, J., Brazo-Sayavera, J., Cardon, G., Chang, C. K., Nyström, C. D., Demetriou, Y., Draper, C. E., Edwards, L., Emeljanovas, A., Gába, A., Galaviz, K. I., González, S. A., . . . Tremblay, M. S. (2018). Global Matrix 3.0 Physical Activity Report Card Grades for Children and Youth: Results and Analysis From 49 Countries. *Journal of Physical Activity and Health*, *15*(s2), S251–S273. <https://doi.org/10.1123/jpah.2018-0472>
- Navarra, G. A., Thomas, E., Scardina, A., Izadi, M., Zangla, D., De Dominicis, S., Cataldo, P., Proia, P., & Bellafiore, M. (2021). Effective Strategies for Promoting Physical Activity through the Use of Digital Media among School-Age Children: A Systematic Review. *Sustainability*, *13*(20), 11270. <https://doi.org/10.3390/su132011270>
- Elsayed, E., & Ashrry, A. (2020). A Proposed Model for Measuring the Performance of Smart Public Parks. *ERJ Engineering Research Journal*, *43*(3), 245–260. <https://doi.org/10.21608/erjm.2020.95301>
- Rainham, D. G., Bates, C. J., Blanchard, C. M., Dummer, T. J., Kirk, S. F., & Shearer, C. L. (2012). Spatial Classification of Youth Physical Activity Patterns. *American Journal of Preventive Medicine*, *42*(5), e87–e96. <https://doi.org/10.1016/j.amepre.2012.02.011>

- Jerrett, M., Almanza, E., Davies, M., Wolch, J., Dunton, G., Spruitj-Metz, D., & Pentz, M. A. (2013). Smart Growth Community Design and Physical Activity in Children. *American Journal of Preventive Medicine*, 45(4), 386–392. <https://doi.org/10.1016/j.amepre.2013.05.010>
- Duan, Y., Wagner, P., Zhang, R., Wulff, H., & Brehm, W. (2018). Physical activity areas in urban parks and their use by the elderly from two cities in China and Germany. *Landscape and Urban Planning*, 178, 261–269. <https://doi.org/10.1016/j.landurbplan.2018.06.009>
- Lai, P. C., & Low, C. T. (2019). Provision of Convenient Play Space in a Densely Populated City. *International Journal of Environmental Research and Public Health*, 16(4), 651. <https://doi.org/10.3390/ijerph16040651>
- Cohen, D. A., Ashwood, J. S., Scott, M. M., Overton, A., Evenson, K. R., Staten, L. K., Porter, D., McKenzie, T. L., & Catellier, D. (2006). Public Parks and Physical Activity Among Adolescent Girls. *PEDIATRICS*, 118(5), e1381–e1389. <https://doi.org/10.1542/peds.2006-1226>
- McCormack, G. R., Patterson, M., Frehlich, L., & Lorenzetti, D. L. (2022). The association between the built environment and intervention-facilitated physical activity: a narrative systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 19(1). <https://doi.org/10.1186/s12966-022-01326-9>
- Giles-Corti, B., & Donovan, R. J. (2002). The relative influence of individual, social and physical environment determinants of physical activity. *Social Science & Medicine*, 54(12), 1793–1812. [https://doi.org/10.1016/s0277-9536\(01\)00150-2](https://doi.org/10.1016/s0277-9536(01)00150-2)
- Hunter, R. F., Christian, H., Veitch, J., Astell-Burt, T., Hipp, J., & Schipperijn, J. (2015). The impact of interventions to promote physical activity in urban green space: A systematic review and recommendations for future research. *Social Science & Medicine*, 124, 246–256. <https://doi.org/10.1016/j.socscimed.2014.11.051>
- Jansson, A. K., Lubans, D. R., Smith, J. J., Duncan, M. J., Bauman, A., Attia, J., Robards, S. L., & Plotnikoff, R. C. (2019). Integrating smartphone technology, social support and the outdoor built environment to promote community-based aerobic and resistance-based physical activity: Rationale and study protocol for the ‘ecofit’ randomized controlled trial. *Contemporary Clinical Trials Communications*, 16, 100457. <https://doi.org/10.1016/j.conctc.2019.100457>
- Kaczynski, A. T., & Henderson, K. A. (2007). Environmental Correlates of Physical Activity: A Review of Evidence about Parks and Recreation. *Leisure Sciences*, 29(4), 315–354. <https://doi.org/10.1080/01490400701394865>
- Cohen, D. A., McKenzie, T. L., Sehgal, A., Williamson, S., Golinelli, D., & Lurie, N. (2007). Contribution of Public Parks to Physical Activity. *American Journal of Public Health*, 97(3), 509–514. <https://doi.org/10.2105/ajph.2005.072447>
- Spengler, J. O., Floyd, M. F., Maddock, J. E., Gobster, P. H., Suau, L. J., & Norman, G. J. (2011). Correlates of Park-Based Physical Activity among Children in Diverse Communities: Results from an Observational Study in Two Cities. *American Journal of Health Promotion*, 25(5), e1–e9. <https://doi.org/10.4278/ajhp.090211-quan-58>