

Users' safety perceptions from crime in relation to park type and user gender in Mexico

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Abstract

While parks hold potential as inclusive spaces for promoting physical activity, perceptions of safety from crime may affect their use, especially in low-to middle-income countries. Safety perceptions may be shaped by gender and park type; however, these relationships have not been explored in Mexico. The aim of this study was to explore associations between safety perceptions and park type by gender. This was a cross-sectional and descriptive study. We assessed perceptions of safety from crime in Mexican adult park users in Jalisco state. Six parks were classified into three categories: 1) Metropolitan parks with controlled gate access (gated), 2) Metropolitan parks without controlled gate access (open), and 3) Linear parks (linear). We ran binary logistic regression models to investigate the association between safety perception and park type, and safety perception and gender. We found that men were more likely to feel safe than women, regardless of park type, and users of linear parks were more likely to feel safe than users of gated parks, regardless of gender. Safety perception is related to park type and park user gender. Future studies should explore which specific park attributes are influencing park user safety perception and how to address gender disparities.

Keywords: Public spaces, Developing nation, Physical activity resources, LMIC.

Park usage has been associated with physical, psychological, social, economic, and environmental benefits globally (Bedimo-Rung et al., 2005; Milton et al., 2021). In Latin America, park users report experiencing benefits related to physical and mental health, quality of life, and life expectancy (Rojas-Rueda et al., 2021). During the COVID-19 pandemic in Mexico, frequent park users reported higher well-being scores than non-users (Mayen Huerta and Utomo, 2021).

In Mexico, national data reveal that 66.6% of adults feel that they live in an unsafe city, with a higher proportion of women than men reporting that they feel unsafe (71% vs 61%, respectively; Instituto Nacional de Estadística y Geografía [INEGI], 2021). Specifically, in Guadalajara, Jalisco, 62.6% of residents perceive parks and leisure activity centres as unsafe which may discourage their use (Instituto de Información Estadística y Geográfica de Jalisco [IIEG], 2021).

Safety perceptions from crime are considered among the most important factors affecting the use of physical activity resources such as parks (Bedimo-Rung et al., 2005; Fontán-Vela et al., 2021; Milton et al., 2021; Sallis et al., 2012; Sarmiento et al., 2021; Türkseven Doğrusoy and Zengel, 2017). Studies from different countries, primarily conducted in high-income-countries (HICs), have found that lower safety perceptions may be related to lower park usage while higher safety perceptions are positively associated with frequency and duration of time spent in these spaces (Lapham et al., 2016; Türkseven Doğrusoy and Zengel, 2017; Zhou et al., 2022). Descriptive and qualitative studies conducted in LMICs have also found that safety concerns may negatively affect park usage (Basu and Nagendra, 2021; Scott and Munson, 1994).

Park characteristics including the presence of gates and/or fences, play a crucial role in shaping safety perceptions among users (Iqbal, 2018). Parks that have a symbolic gate and boundary walls but do not control access may be perceived as safe or unsafe depending on the circumstances (Ajayi, 2020; Buratti and Merino-Pérez, 2023; Iqbal, 2018). Large metropolitan or urban parks that are integral to city identity and known for their expansive size and accessibility are often well attended during the day, which can enhance user safety perceptions from crime (Ajayi, 2020; Secretaría de Desarrollo Urbano y Vivienda [SEDUVI], 2012; Thawaba, 2014). Similarly, well maintained and renovated linear parks that connect areas of a city are regularly used by pedestrians, cyclists, children and parents, which can enhance user safety perceptions from crime (Buratti and Merino-Pérez, 2023). In contrast, smaller public spaces, such as pocket parks, vary in safety perception depending on their maintenance and amenities (Cohen et al., 2014; Martínez Salvador and Alvarado Ramírez, 2020). Evidence from Mexico shows that the presence and maintenance of amenities like lightning help to increase the perception of safety in pocket parks, while poor

park maintenance and isolated location may be perceived as less safe and deter visitors in linear parks (Martínez Salvador and Alvarado Ramírez, 2020; Buratti and Merino-Pérez, 2023).

Gender and sex are also related to perceptions of park safety. Gender has been found to significantly influence safety perceptions, with women consistently reporting lower feelings of safety from crime in parks located in low- and middle-income countries (LMICs) compared to men (Basu and Nagendra, 2021; Türkseven Doğrusoy and Zengel, 2017). Similarly, Espinoza Duran et al., (2017) found significant differences between male and female park safety perceptions, where females felt less safe than males in parks in Costa Rica. The authors noted that even though females in their study were not more likely to report being a victim of crime, they were more afraid of crime. Finally, Polko and Kimiç (2022) found that women and men consider different park characteristics when assessing safety; gender may modify the relationship between presence or quality of specific park characteristics and safety perception.

Exploring how park users' safety perceptions vary across park types and by gender is crucial to understanding how to design, adapt, and promote parks to improve safety perceptions and encourage use for all genders equitably (Sarmiento et al., 2021). To date, little research has explored these relationships in the Mexican context. Consequently, this study aimed to explore associations between safety perceptions, park type and gender, and to examine if gender modifies the relationship between park type and safety perception.

Methods

Study Design and Setting

This was a multi-site, cross-sectional, and observational study conducted in Guadalajara, Jalisco state, Mexico. According to the Instituto Nacional de Estadística y Geografía [INEGI], (2020), The Metropolitan area of Guadalajara (Guadalajara, Tlaquepaque, Tonalá, and Zapopan) has a population of 5,268,642 (INEGI, 2020). There are approximately 250 parks of various sizes that can be classified into gated, open and linear park types in the Metropolitan area of Guadalajara (Gobierno de Guadalajara, 2024).

Our study was ancillary to a larger study on parks in Guadalajara conducted by the Institute of Sciences Applied to Physical Activity and Sports (ICAAFYD). All procedures and instruments used in this study were approved before their application in 2021 by the Research, Research Ethics, and Biosafety Committees of the Health Sciences University Center of the University of Guadalajara (approval number CI-00122).

Types of Parks

Data were collected in six parks in Guadalajara, Jalisco: Parque Colomos, Parque Morelos, Parque San Jacinto, Parque Av. Maestros, Parque Av. Pablo Neruda, and Parque González Gallo. These parks were classified into three categories based on the Ministry of Urban Development and Housing definitions and presence of gates (SEDUVI, 2012), 1) Metropolitan park with controlled gate access (gated); 2) Metropolitan park without controlled gate access (open); and 3) Linear park (linear). Metropolitan parks were defined as parks bigger than 10,000 m². Linear parks are defined as public spaces along large avenues, disused railway tracks, rivers, streams, canals, and urban voids (SEDUVI, 2012). The linear parks included in this study were along avenues. The size of the metropolitan parks (meters²) and length of the linear parks (kilometers) were ascertained by using Google Earth 10.35.3.4 tool (Google Earth, 2023). Parks were selected for inclusion in the study based on their location to maximize the safety of the team who were travelling to the parks to collect data.

Respondents and Procedures

Research assistants responsible for data collection were students in the Masters of Physical Activity and Healthy Lifestyle program at the University of Guadalajara in the ICAAFYD. This team consisted of 15 women and 5 men who received theoretical and practical training developed at ICAAFYD. Each park was visited twice by a pair of research assistants.

Mexican adult park users between the ages of 18 and 64 years were considered eligible to participate in this study. Research assistants visually estimated park users' age and approached park users who appeared to meet this eligibility criteria. Prospective recruits received verbal information and provided verbal informed consent. Research assistants read questions to participants from a ten-minute questionnaire and wrote down respondents' answers on paper.

Measures

Information about the respondents' sociodemographic characteristics, including gender, household income, education, and marital status, was collected. We asked respondents if they identified as a man or a woman. Household income was ascertained from five questions based on the National Health and Nutrition Surveys of Mexico (Gutiérrez et al., 2012).

Safety perception from crime was assessed with the "Park safety perception item" developed by Salvo et al. (2014) from the subscale of "Safety from crime" of the Neighborhood Environment Walkability Scale–Abbreviated (NEWS-A; Cerin et al., 2013) that was translated into Spanish and adapted for use in Latin America for measuring perceptions of environmental features (Cerin et al., 2013). The NEWS-A structure

applied in Mexico has demonstrated good test-retest reliability (SRMR=0.068, CFI=.915) to report perceptions of the environment (Jáuregui et al., 2016; Salvo et al., 2014). Furthermore, the Safety from Crime subscale has shown adequate standardized factor loadings on each independent item (Unsafe to walk during the day= 0.62; and Unsafe to walk during the night= 0.81) to assess safety perceptions from crime (Cerin et al., 2013).

Using a 4-point scale (1 = strongly disagree, 4 = strongly agree), respondents ranked two statements: "The parks are unsafe to visit during the day", and "The parks are unsafe to visit during the night" (Salvo et al., 2014). Safety perception scores were dichotomized into a binary outcome variable: unsafe park (score ≥ 3) or safe park (score < 3) according to the participant's mean score (Salvo et al., 2014).

Data Analysis

Descriptive analyses were conducted for all variables (Table 1). Chi-square tests were performed to determine if sociodemographic characteristics (marital status, education, and household income) were comparable between the men and women respondents, and between respondents in different park types. A weighting adjustment based on a total sample size of $n=395$ was applied to minimize sample discrepancies between park types and genders. Finally, vectors were created to weight the original sample sizes by multiplying each observation with its corresponding weighting factor for each type of park and gender group. These vectors were taken into account when running the logistic regression analyses. This process allowed us to compensate for sample size differences between groups and provided more reliable estimates of the regression models (Pasek, 2022).

Binary logistic regression models were conducted to examine safety perception according to park type and gender. We ran crude models to assess the bivariate association between safety perception and park type, and between safety perception and gender. Then, we ran an adjusted model that included park type and gender as predictors. An interaction term between park type and gender was also entered into the model to determine if the relationship between safety perception and park type was modified by gender.

The adjusted model controlled for marital status, monthly household income, and education. Dummy variables were created as needed. Statistical significance for all regression analyses was set at $p < 0.05$. The odds ratios calculated represent the probability of users feeling safe. Statistical analyses were conducted using RStudio version 2023.09.1+494.

Results

We surveyed 395 eligible adults from three different types of parks (gated=261, open=56, linear=78). Table

1 presents park users' sociodemographic characteristics stratified by gender. Women made up 45.6% of the analytic sample (Table 1). Respondents differed significantly in monthly household income ($X^2=35.50$, $df=12$, $p=0.0003$) and education ($X^2=72.98$, $df=18$,

$p<0.0001$) by park type. Men and women differed significantly in marital status ($X^2=9.77$, $df=3$, $p=0.0205$). Therefore, we controlled for household income, education, and marital status in our adjusted model.

Table 1. Park users' sociodemographic characteristics stratified by gender.

Sociodemographic characteristics	Women n=180	Men n=215
Marital status		
Single	75 (41.7%)	116 (53.9%)
Married/living with someone	87 (48.3%)	91 (42.3%)
Divorced/separated	15 (8.3%)	7 (3.3%)
Widower	3 (1.7%)	1 (0.5%)
Education		
No studies	1 (0.5%)	3 (1.4%)
Elementary school	30 (16.7%)	34 (15.8%)
High school level	50 (27.8%)	69 (32.1%)
Postgraduate studies	99 (55.0%)	109 (50.7%)
Work status		
Employed	136 (75.6%)	185 (86.0%)
Unemployed	35 (19.4%)	21 (9.8%)
Retired	9 (5.0%)	9 (4.2%)
Monthly household income		
\$0 – 523 USD	54 (30.0%)	72 (33.5%)
\$524 – 1,540 USD	84 (46.7%)	100 (46.5%)
\$+ 1541 USD	9 (5.0%)	20 (9.3%)
No answer	33 (18.3%)	23 (10.7%)
Safety perception		
Safe	81 (45.0%)	116 (54.0%)
Unsafe	99 (55.0%)	99 (46.0%)
Users by park type		
Gated parks	114 (63.4%)	147 (68.4%)
Open parks	26 (14.4%)	30 (14.0%)
Linear parks	40 (22.2%)	38 (17.6%)

Results of the crude and adjusted models are presented in Table 2. The adjusted model controlled for marital status, household income, and education. In the adjusted model, the interaction between park type and gender was not significantly associated with safety perception ($p=0.885$) and thus was dropped from the model. There was a significant association between safety perception and park type regardless of gender.

Respondents were more likely to perceive linear parks as safe compared to gated parks (OR=2.91, 95% CI: 2.85–2.99, $p<0.0001$) while respondents perceived open parks similarly as safe as gated parks (OR=0.94, 95% CI: 0.44–1.45, $p=0.829$). There was also a significant association between safety perception and gender; men were more likely than women to feel safe (OR=1.64, 95% CI: 1.21–2.07, $p=0.023$) regardless of park type.

Table 2. Associations between safety perception and park type and gender.

Variables	Crude Model					Adjusted Model ^c				
	β	SE	OR	95% CI	P-value	β	SE	OR	95% CI	P-value
Open parks^a	-0.10	0.25	0.89	0.41 – 1.39	0.665	-0.05	0.25	0.94	0.44 – 1.45	0.829
Linear parks^a	1.05	0.20	2.87	0.55 – 1.56	<0.001	1.07	0.27	2.91	2.85 – 2.99	<0.001
Gender^b	0.41	0.20	1.51	1.12 – 1.91	0.041	0.49	0.21	1.64	1.21 – 2.07	0.023

Note: β logistic regression coefficient, SE Standard error, OR Odds ratio (likelihood of feeling safe) 95% CI 95% confidence interval of the OR.

^aGated parks were the reference group.

^bWomen were the reference group for gender variable.

^cModel adjusted by marital status, education, and monthly household income.

Discussion

This study examined associations between safety perception, park type, and gender among men and women users of three different park types in Guadalajara, Mexico. We found important associations demonstrating that men report feeling safe in parks more commonly than women; and linear parks are perceived as safer compared to gated parks. As far as we know, no published literature has compared these three park types or their relationship to safety perceptions and gender of park users.

We found that linear parks were considered safer than gated parks; however, we found no difference in perception of safety between open and gated parks in our sample of parks in Guadalajara, Mexico. Although it is difficult to compare our findings with previous research given differences in park size, location, and other key park characteristics that have been studied, our results do show some similarities with previous work from other countries. For example, in a study of two urban parks in Turkey, Türkseven Doğrusoy and Zengel (2017) found that park users felt safer in the park without walls compared to the park with boundary walls. In contrast, studies in Pakistan and Poland reported gate control access, fences, or boundary walls may improve park users' safety perception (Iqbal, 2018; Polko and Kimic, 2022). These discrepant findings suggest that factors beyond a boundary wall or gate may influence the relationship between park type and safety perception. Previous studies have reported users' sense of belongingness, the use parks for socializing, and perceived importance to the community as important factors that shape park safety perceptions across diverse contexts (Buratti and Merino-Pérez, 2023; Martínez Salvador and Alvarado Ramírez, 2020; Layton et al., 2016). It is essential to consider other factors related to park design that could deter crime and shape safety perceptions, such as: having clear sightlines and adequate lighting, encouraging legitimate park use by making the spaces appealing and offering organized activities, and keeping parks well-maintained (Cozens et al., 2005). Future studies should explore

why users feel safer in linear parks compared to gated parks, and how different park types can be improved to promote perceptions of safety and encourage use of these low-cost physical activity resources

We found that women were less likely to feel safe in parks compared to men, which is consistent with national data from Mexico, and previous studies from LMICs and HICs (IEEG, 2021; INEGI, 2021; Carro et al., 2010; Basu and Nagendra, 2021; Espinoza Durán et al., 2016; Türkseven Doğrusoy and Zengel, 2017; Lapham et al., 2016; Lopez et al., 2020). Study authors suggested a variety of reasons for this difference, including that women are physically weaker, more afraid of strangers, or that women feel more vulnerable (Türkseven Doğrusoy and Zengel, 2017; Basu and Nagendra, 2021; Carro et al., 2010; Espinoza Durán et al., 2016). Considering that women generally feel less safe than men, including outside of parks, our study finding is unsurprising (Hille, 1999; Loukaitou-Sideris, 2014; Pain, 2001). It is essential to locate our findings within the broader cultural climate and to acknowledge that despite significant improvements in recent years, women in Mexico are still at high risk of gender-based violence, with about 2/3 of women reporting experiencing violence in their lifetime (Htun and Jensenius, 2022; INEGI, 2017). These gender violence situations might influence women's park attendance, potentially discouraging their use of these spaces. Efforts to promote park use must thus be pursued through a gender-equity lens with consideration of wider societal influences.

Given that our assessment was limited to park type, it is not surprising that gender did not modify the relationship between safety perception and park type in our study. Polko and Kimic (2022), whose study also found no difference between women's and men's safety perception related to fences, boundary walls, and park visibility, found that safety perception in women park users was influenced by the time of day, season, condition of the pavement and park equipment, availability of ramps and lifts, and presence of greenery, paths, and bikers or people using sports equipment.

Future research should explore whether specific park attributes modify the relationship between safety perception and gender, particularly in LMICs where crime is a detrimental factor for the community as in Mexico (Cozens et al., 2005; Layton et al., 2016; IIEG 2021).

Strengths and Limitations

This study adds to the literature investigating relationships among between safety perception, park type, and gender in a Mexican context; where most investigations of perceived safety in parks has been conducted in HICs. Other strengths are that safety perception data were collected using items validated for a Mexican population and were collected in parks, allowing us to include park users as respondents, which is different from previous studies that surveyed users outside of the park (Salvo et al., 2014; Mayen Huerta and Utomo, 2021; Salvo et al., 2014).

It is important to consider the limitations of our study. Our sample was limited to a convenience sample of men and women aged 18 to 64 years, which affects the generalizability of our findings to other age groups, particularly considering previous reports that safety perceptions may manifest differently in older adults (Pérez-Tejera et al., 2022). Furthermore, our study only included binary options for gender; this precludes an examination of the relationship between safety perception, gender, and park type for park users who do not identify as women or men. Future studies should explore safety perception of park users of all ages, including those with a non-binary gender identity.

We only had resources to sample six parks from a large number of parks available in Metropolitan Guadalajara. Parks were selected for inclusion if we considered them safe enough for the field team to visit. It is possible that the inclusion of parks deemed as less safe would have yielded different results. More studies are needed to rule out sampling and procedural artifacts. Our study did not account for specific within park attributes that may influence the relationship between safety perception, gender, and park type (e.g. park size, presence of dog parks and incivilities) (Cozens et al., 2005; Layton et al., 2016; Buratti and Merino-Pérez, 2023; Martínez Salvador and Alvarado Ramírez, 2020). Mexico is a country with high accessibility to open-public physical activity resources and represents spaces for community coexistence; however, it has been recognized that these spaces have low quality, and it might represent a barrier to their use (SEDUVI, 2012; and Martínez-Salvador and Alvarado-Ramírez, 2020; Soltero et al., 2015). One study of eight physical activity resources (of which 7 were parks) in Puerto Vallarta, Jalisco found that those with higher quality amenities had more users (Soltero et al., 2015). Further investigation is warranted.

Finally, our study only includes quantitative data, it would be valuable to complement findings with qualitative data that could provide a deeper insights into

the relationship between gender, park type and safety perception. Interviews of focus groups could uncover nuanced reasons behind the uniform safety perceptions (Iqbal et al., 2018).

Conclusion

This study found that participants considered linear parks safer than gated parks and regardless of park type, men reported higher safety perceptions than women. Given the positive benefits associated with park usage, our study highlights the importance of understanding how to design, adapt, and promote parks that feel safe to all the population, especially to vulnerable groups, like women in Mexico, to ensure these spaces are inclusive and equitable physical activity resources (IEG 2021; INEGI 2021). Previous findings from HICs demonstrating that sociodemographic factors like gender may influence safety perception, suggesting a more nuanced relationship, worthy of future investigation (Layton et al., 2016; Lapham et al., 2016; Iqbal et al., 2018). Given that in general women tend to feel less safe compared to men in Mexico, representing a substantial public health issue, future studies need to explore which specific park factors are related to safety perceptions for women (Layton et al., 2016; Polko and Kimic, 2022). Moreover, as societal definitions of gender change, future investigations should include other genders (e.g., non-binary; Valencia et al., 2023; Zhang and Bandara, 2024). Future work should identify strengths and points of improvement in park design to promote equitable and inclusive physical activity spaces for all.

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Rebecca E. Lee: Critical revision of manuscript.

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Conflict of Interest Statement

There are no conflict of interests declared by the authors.

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