

Mapping the fear-scape of the University of Benin: spatial and social dimensions of perceived safety and their implications for campus life

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Abstract

Fear significantly shapes mobility, learning, and social interaction on university campuses, yet it is rarely analysed as a spatial phenomenon within Nigerian higher-education environments. This study examines the fear-scape of the University of Benin's Ugbowo Campus, focusing on how environmental design, residential context, and temporal conditions interact to structure students' perceptions of insecurity. A mixed-method embedded research design was employed. Quantitative data were collected through structured surveys and analysed using Student's *t*-tests, MANOVA, correlation and regression analyses, and Kernel Density Estimation (KDE) in ArcGIS to model the spatial distribution of fear. Qualitative narratives were used to contextualise and explain observed spatial and statistical patterns. Results reveal temporal and spatial variation in fear perception. Mean fear levels are significantly higher at night ($p < .001$), with KDE mapping identifying persistent night-time hotspots around hostels (Halls 1–5), the ICT, Life Sciences corridor, and the Faculty of Agriculture areas which are characterised by weak lighting, limited natural surveillance, and ambiguous territorial cues. Correlation analysis shows a strong inverse relationship between fear and perceived security (night-time $r = -.401$), while regression results indicate that environmental and locational factors explain fear more effectively than demographic characteristics, accounting for approximately 13% of variance. Although women, married respondents, and off-campus residents report higher fear levels, residential context and spatial conditions emerge as the most consistent predictors. Qualitative findings corroborate these results, revealing avoidance of evening lectures, restricted mobility, and reduced social participation in high-fear zones. The study demonstrates that fear on campus is spatially produced and environmentally reinforced, rather than solely individual or demographic in origin. Practically, the findings supported targeted lighting upgrades, surveillance placement, and spatial reconfiguration within identified fear hotspots as concrete planning responses. This established a transferable, spatially grounded model for campus safety intervention rather than generalised security enhancement.

Keywords: *fear-scape, campus safety, gender differences, environmental criminology, situational crime prevention, defensible space*

Introduction

University campuses are usually imagined as environments dedicated to learning, debate, and personal development. Yet this ideal often obscures a more complicated spatial reality. Some parts of a campus evoke unease, restrict movement, and quietly undermine the freedom education depends on. This study adopts the idea of fear-scape, drawn from the merging of fear and landscape (Valentine, 1989; Gold, 2003; Tulumello, 2017; Bleicher, 2017), to capture these environments. Fear-scape was not treated as a synonym for fear of crime. Here is what mattered. Fear of crime referred primarily to emotional responses to perceived victimisation risk, often measured at the individual level. Fear-scape, by contrast, captured how fear became spatially embedded and socially reproduced within specific urban settings. It reflected the spatial persistence of fear across time, even when crime levels changed, the behavioural avoidance patterns through which residents

modified movement, timing, and place use, and the environmental cues such as lighting, land use, building form, and territorial disorder that signalled danger. Fear-scape enabled fear to be mapped, compared across places, and addressed through spatially targeted planning and policy interventions rather than remaining a purely psychological or attitudinal construct. A fear-scape is not only a dangerous location. It is any space where perceived insecurity shapes behaviour, emotions, and interaction. Universities are commonly portrayed as open, enlightened, and secure settings. Yet their physical arrangements often produce pockets of anxiety. Lighting, visibility, isolation, and circulation routes influence how people develop their sense of belonging. Students and staff quickly learn that certain paths, car parks, or corridors feel unsafe at particular times (Traffic Management Products Ltd., n.d.). These small but significant geographies of caution form what Valentine (1989) and others describe as landscapes of fear: everyday settings marked by avoidance and

apprehension. Operationalising fear-scape means translating an abstract idea into observable, measurable elements that can be analysed empirically. Fear-scape is not fear in isolation. It is fear as it is produced, distributed, and experienced across space (Tulumello, 2015).

The University of Benin (UNIBEN) is a reflection of this tension. The campus is planned with academic zones, hostels, green spaces, and recreational areas. These divisions reflect modernist planning ideals, yet they also generate isolated pockets. Poor lighting, bushy surroundings, and areas with little night-time movement heighten vulnerability, especially for female students. The campus therefore reproduces wider insecurities that characterise Nigerian cities. Instead of being a protected academic community, the space mirrors the uncertainty of the broader urban landscape.

Fear-scape in this research captures the spatial pattern of perceived vulnerability across UNIBEN. It reflects how environmental cues, time of day, and behavioural avoidance interact. This matters in Nigeria, where insecurity linked to armed attacks, cultism, harassment, and kidnappings has intensified fear in public spaces (Tulumello, 2015; Mayowa et al., 2021). Campuses are not insulated from these pressures. On UNIBEN's grounds, inadequate lighting, isolated walkways, and limited patrol presence fuel unease after dark. These conditions shape academic habits, limit social engagement, and strain mental health (Pain, 2000; Sabo et al., 2024; Rani, 2025). Fear becomes both a psychological burden and a spatial reality that disrupts the core values of higher education.

The broader Nigerian context reinforces this. Insecurity has become part of everyday life (Osisanwo, 2025). Cult clashes, robberies, and harassment have entered spaces once thought safe. This creates a cycle where fear governs movement, interactions, and daily routines (Tulumello, 2015; Bleicher, 2017). On campuses, these fears are collective and spatially reinforced rather than purely personal (Sloan et al., 2000; Fisher & May, 2009; Roberts, 2022; Huang et al., 2022; Tarus, 2025). People's sense of danger depends heavily on environmental cues. Poor visibility, the absence of security personnel, or a reputation tied to past incidents all shape perception (Huang et al., 2022).

The fear-scape idea offers a useful lens for analysing how these perceptions develop and persist (Bleicher, 2017; Rai & Rai, 2019; Trogisch, 2022). Fear is not only emotional. It is produced through interactions between people, place, and power. A benign path in daylight can become threatening at night. An empty hostel corridor or an overgrown shortcut can generate long-term avoidance. As Sági (2022) notes, these changes in movement are not trivial. They reshape the geography of campus life and slowly become embedded in collective behaviour. Fear becomes part of how people inhabit the University of Benin's spaces.

Scholars argue that fear of crime can have deeper effects than crime itself (Pain, 2000; Lorenc et al., 2024; Lane, 2015; Piscitelli & Perrella, 2017; Wilk & Fibinger, 2020). On campuses, this gap between perception and reality can be particularly wide (Huang et al., 2022; Snider, 2023). At UNIBEN, rumours and isolated incidents circulate quickly, strengthening the sense of insecurity regardless of actual risk. Fear becomes performative. It changes how people walk, how they gather, and how they interpret their surroundings. It is at once socially constructed and anchored in material cues.

Fear affects educational participation (Barrett et al., 2022; Sas, 2021; Park et al., 2025). Students may avoid evening lectures, choose not to read in quiet locations, or limit their presence on campus after dusk. Staff may avoid staying late to work or supervise activities. Over time, these patterns weaken the academic community. The campus becomes physically accessible yet psychologically restrictive. A sense of fragmentation takes hold.

Although insecurity on Nigerian campuses receives scholarly attention, much of it focuses on incidents, harassment, crime rates, or policy responses rather than on lived spatial experiences. Blöbaum & Hunecke (2005) emphasise that perception often drives behaviour more strongly than objective risk. This research responds by treating fear as spatially patterned and diagnostically meaningful. It shifts attention from crime statistics to how people interpret and inhabit the campus environment.

Fear also carries institutional implications. A university's standing depends partly on how safe people feel within it. Persistent fear corrodes trust, reduces participation in evening activities, and weakens social life (Ruocco, 2021). Neglect physical decay, broken lights, and unmonitored corridors produces symbolic messages of abandonment. These messages stick. They feed collective memory and shape long-term beliefs about danger. Once established, such impressions are slow to fade even after physical improvements.

This study investigates the fear-scape of the University of Benin's Ugbowo campus by identifying fear-inducing locations, analysing spatial patterns of insecurity, and examining how these perceptions shape academic participation, mobility, and social relations. Through this approach, the research contributes to three wider debates. First, it adds to environmental criminology by elevating perception as an analytical focus alongside actual crime. Second, it expands the study of fear geography, demonstrating how GIS and spatial tools can be applied to campus insecurity. Third, it intersects with global discussions on safe learning environments linked to SDG 4 on quality education and SDG 11 on inclusive and safe settlements.

The central argument is straightforward. Fear on campuses does not spread randomly. It clusters in specific locations where environmental cues, social

interactions, and institutional shortcomings converge. This clustering forms a fear-scape produced by the interplay of physical design and emotional experience. When people avoid these places, they become even more isolated, less monitored, and more vulnerable to the dangers they fear. Fear therefore both reflects and reinforces insecurity.

Understanding the spatial pattern of fear is both a safety concern and a developmental requirement. Universities cannot claim inclusivity while fear continues to limit access and participation. As Nigeria's higher education system expands, spatial safety must become an essential component of academic planning. UNIBEN, with its large and complex layout, offers a strong case study that reflects the contradictions facing many African campuses. To advance understanding of the spatial patterning of fear on campus, three hypotheses were formulated. First, students' residential location has no statistically significant effect on their perceptions of fear, campus security, and campus safety. Second, there is no statistically significant association between perceptions of fear, security, and safety across day and night periods on the University of Benin campus. Third, demographic characteristics and residential location do not significantly predict overall fear levels among campus users at the University of Benin.

This research uses fear-scape as a conceptual and methodological tool. Drawing on environmental criminology, situational crime prevention, defensible space theory, spatial mapping, and perception-based data, it aims to reveal the invisible geographies of fear that shape everyday academic life. Before a campus can become genuinely safe, those responsible for its management must know where fear settles, how it travels, and whom it marginalises. Making these emotions visible is the first step toward improving security in a meaningful and lasting way.

Theoretical background

This section should critically discuss the theoretical concepts relevant for the current paper, so as to lay the foundation for further work (study hypothesis and objectives). It should provide the background on the understanding of the existing research and debates relevant for the particular topic addressed by the paper so as to inform the reader about the state-of-the-art research for this topic and highlight the gaps in the existing research. A thorough review should bring clarity and focus to the research problem and would help contextualize the findings.

Environmental Criminology

Environmental criminology, developed by Paul and Patricia Brantingham in the early 1980s, grew from the recognition that criminal behaviour cannot be separated from its spatial setting. Drawing on the ecological

foundations of the Chicago School and the routine activity theory of Cohen & Felson (1979), it argues that the "where" of crime is as significant as the "why." The approach focuses on the spatial and situational conditions that shape offending, proposing that the built environment, daily movement patterns, and land-use arrangements collectively influence opportunities for crime and perceptions of safety (Brantingham & Brantingham, 1981).

Two concepts frame this perspective. Crime generators are locations that draw large numbers of people for legitimate reasons, increasing the likelihood of encounters between potential offenders and victims (Cozens & Linde, 2015; Liu et al., 2024). On a university campus, these may include bus stops, lecture theatres, or student centres. Crime attractors, in contrast, are places known for opportunities for unlawful behaviour, which draw offenders precisely because of their vulnerability (Weisburd et al., 2021; Brantingham et al., 2020). Poorly monitored car parks or dimly lit pathways often fall into this category.

At its core, environmental criminology assumes that crime is patterned rather than random, shaped by predictable human movement and environmental cues (Brantingham & Brantingham, 2021; Uduo, 2025). Both offenders and potential victims create "awareness spaces" mental maps of familiar routes where they feel able to assess and manage risk (Johnson & Summers, 2015; Curtis-Ham et al., 2023). Design elements such as visibility, accessibility, lighting, and natural surveillance therefore become decisive in shaping feelings of safety. Poor lighting, obstructed sightlines, and low activity levels can create edges of fear, triggering anxiety even when no crime is occurring.

While environmental criminology has traditionally focused on explaining the spatial logic of crime occurrence, its concepts are equally useful for understanding the geography of fear. Awareness spaces are not neutral cognitive maps; they are emotionally charged and shaped by prior experiences, social narratives, and institutional trust. Fear emerges where environmental cues signal vulnerability, ambiguity, or neglect, even in the absence of direct victimisation. By extending environmental criminology from crime patterning to fear patterning, this study treats fear as an ecological outcome embedded in spatial routines rather than a purely individual psychological response.

Research over the past four decades shows how environmental design shapes perceptions of safety. Cozens & Sun (2019) identified "hot spots of fear" in university settings and demonstrated that spatial isolation and poor visibility closely correlate with insecurity. Mehta (2013) found that open, well-lit spaces with heavy foot traffic reduced fear, highlighting the preventive role of design. African studies (Badiora, 2017; Moral & Gafar, 2021; Agberagba & Amupitan, 2024) reveal similar patterns, noting that infrastructural neglect

and disorganised space intensify insecurity in Nigerian tertiary institutions.

Within the University of Benin, environmental criminology underpins the analysis of the campus fear-scape. This study applies the framework to examine how lighting, vegetation density, building orientation, and pathway connectivity shape students' perceptions of risk. By integrating spatial data with survey responses, it identifies high-risk zones and traces how avoidance behaviour links to specific environmental attributes.

In doing so, the study extends environmental criminology beyond crime incidence to the geography of fear, treating the campus as an ecological system where spatial form and social experience continually interact. Fear-scape thus becomes the experiential expression of environmental criminology, translating spatial vulnerability into lived anxiety and behavioural response. Understanding this relationship offers campus management practical entry points for transforming fearful spaces into safer, more inclusive environments.

Situational Crime Prevention

Situational Crime Prevention (SCP), developed by Ronald V. Clarke in the late 1970s and formally articulated in 1983, emerged as a practical response to earlier criminological theories that concentrated on offender motivation rather than the environments in which crime occurs. Drawing from environmental criminology and rational choice theory, Clarke argued that crime could be prevented not by transforming the offender but by altering the specific conditions that make offending possible (Clarke, 1983; Cornish & Clarke, 1986). SCP reframes crime prevention as a situational task focused on reducing opportunities, increasing perceived risks, and minimising potential rewards for offenders (Evans et al., 2024; Akinbowale et al., 2024). It builds directly on Cohen & Felson's (1979) routine activity theory, which holds that crime occurs when a motivated offender, a suitable target, and the absence of a capable guardian converge in time and space.

SCP assumes that offenders are rational decision-makers who weigh risk, effort, and reward. When environments become more difficult to exploit through improved surveillance, access control, or visibility, both crime and fear tend to decline. Clarke (1997) outlined five strategies that guide SCP interventions: increasing the effort required to offend, increasing the risks of detection, reducing the rewards of offending, reducing provocations, and removing excuses. These strategies marked a shift from trying to rehabilitate offenders to modifying environments to limit opportunities.

Beyond its crime-control logic, SCP is increasingly recognised as a framework for managing fear. Opportunity structures that enable crime also communicate insecurity to users of space. Poor lighting, concealed routes, and weak guardianship heighten fear not only because they allow offending but because they

symbolise abandonment and reduced institutional control. Fear-scape analysis strengthens SCP by providing a perceptual metric through which the effectiveness of situational interventions can be evaluated. An intervention that reduces incidents but leaves fear intact remains incomplete.

SCP has been widely applied across urban spaces, transport networks, retail environments, and educational institutions. Research from Western contexts (Yang et al., 2024; Tykesson, 2025) shows that targeted environmental adjustments such as enhanced lighting, CCTV coverage, and clear spatial boundaries significantly reduce crime and fear of crime. Campus-focused studies such as Fernandez (2005), Carrico (2016) and Puckett (2022) highlight the value of visibility, natural surveillance, and access control in preventing assault and reducing students' fear. Research by O'Neill & McGloin (2007) and Auzeen & Rob (2019) further shows that territorial reinforcement and environmental maintenance do more than reduce incidents; they strengthen perceptions of safety and support greater use of shared spaces.

Although fewer African studies apply SCP, its relevance is clear. Ajadi (2025) and Adebamiwa (n.d.) identified poor lighting, weak surveillance, and disorganised spatial layouts as key contributors to insecurity in Nigerian universities. Their work shows that environmental modification is both feasible and effective in resource-constrained contexts.

In this study, SCP serves as a practical framework for analysing the fear-scape of the University of Benin. It is used to examine how conditions such as lighting quality, pathway isolation, vegetation density, and guardianship levels shape opportunities for crime and fear. Low-guardianship zones areas with inadequate lighting or limited surveillance are likely to attract offending and heighten perceived danger. High-guardianship zones, by contrast, reduce fear through visibility and collective presence. By integrating fear-scape into SCP, the study reframes prevention as both a security and emotional governance task. The goal is not only to deter offenders but to restore confidence, reduce avoidance behaviour, and normalise everyday use of campus spaces.

By integrating SCP with spatial analysis and perception surveys, the study identifies environmental factors that amplify or reduce fear, evaluates current guardianship mechanisms, and proposes interventions suited to the UNIBEN campus. SCP complements environmental criminology by explaining not only where fear concentrates but how it can be reduced through tangible, evidence-based environmental strategies.

Defensible Space

Defensible Space Theory (DST), developed by Oscar Newman in the early 1970s, remains one of the most influential frameworks linking spatial design to crime prevention and the everyday experience of safety.

Newman's intervention emerged at a moment when American public housing estates were troubled by rising crime and social disorder. He observed something planners had long overlooked: architectural form and spatial organisation can either strengthen or weaken residents' sense of control. His argument was simple. When people feel ownership of their surroundings, they watch over them. When space feels anonymous or neglected, it invites deviance, avoidance, and fear (Newman, 1976; Atlas, 1990; Fisher et al., 2013; Lee et al., 2016).

DST rests on four principles. Territoriality strengthens the boundary between public and private space, encouraging people to claim responsibility. Natural surveillance improves visibility and makes suspicious behaviour easier to detect. Image concerns the physical appearance of a place and its ability to signal order or neglect. Milieu captures the wider environmental context, including proximity to busy streets or high-risk zones. Together, these principles explain why some environments foster safety while others become pockets of fear (Fennelly & Perry, 2018).

Defensible Space Theory is particularly relevant to fear-scape because fear often emerges where territorial cues collapse. Spaces that lack clear ownership, maintenance, or social presence become defensible voids, environments that exist physically but fail socially and emotionally. Fear-scape captures how these voids are experienced and remembered, explaining why avoidance persists even when crime is sporadic.

Empirical work across continents supports these ideas. Coleman (1985) showed that large, poorly defined British estates encouraged vandalism and social withdrawal, while smaller, clearly bounded courtyards promoted interaction and informal guardianship. Taylor et al. (1984) demonstrated that visibility and coherent spatial layouts strengthened neighbourly oversight. Within university settings, Fisher & Nasar (1992) and Fisher & May (2009) found that lighting, open sightlines, and uncluttered pathways significantly lowered fear, particularly among female students.

Yet evidence from the Mozart Estate in Westminster complicates the picture. Research by Queens Park Community Council (2025) showed that although design interventions inspired by Coleman, such as removing elevated walkways and improving lighting, initially reduced burglary, crime and social problems persisted. Many residents continued to feel unsafe. Their experience revealed a crucial limitation: physical redesign alone cannot resolve insecurity when deeper social, economic, and maintenance issues remain unaddressed. DST can guide spatial improvement, but it must operate alongside community engagement, responsive management, and equitable policy.

DST later inspired Crime Prevention Through Environmental Design (CPTED), which translates its principles into practical planning interventions. In African

universities, studies show that poor maintenance, uncontrolled vegetation, and weak territorial cues create "defensible voids" spaces that exist on the map but lack ownership and guardianship (Ogunode et al., 2023).

In the University of Benin, DST helps explain how lighting, visibility, activity patterns, and cues of care or neglect shape the fear-scape. When students avoid certain paths, they withdraw informal guardianship, deepening the cycle of fear Newman described. When spaces feel open, active, and well-maintained, collective confidence strengthens. Fear-scape adds a temporal and symbolic layer to DST by showing how fear accumulates through repeated exposure, stories, and shared warnings. Spaces may be technically defensible yet remain feared due to reputational stigma or past incidents. This explains why some campus spaces remain avoided despite formal security presence.

Improving safety at UNIBEN requires both environmental stewardship and shared responsibility. The right to feel safe depends not only on policing but on environments that support belonging and everyday vigilance.

Interrelatedness of the Theories

The three theoretical frameworks, Environmental Criminology, Situational Crime Prevention (SCP), and Defensible Space Theory (DST) are deeply interrelated through their shared focus on how spatial and situational conditions influence crime and fear. Each provides a distinct but complementary perspective on the relationship between the physical environment and human behaviour. Environmental Criminology offers the foundational logic by situating fear and crime within spatial patterns, explaining where and why they concentrate through the interaction between movement, spatial structure, and environmental cues. This spatial perspective forms the bedrock upon which SCP and DST are built, highlighting that the configuration and management of the built environment directly shape both perceived and actual safety.

SCP extends this spatial understanding by focusing on practical means of modifying environments to reduce opportunities for crime. It operationalises environmental criminology's insights through interventions such as improved lighting, increased visibility, and controlled access. All aimed at discouraging offenders' effort while reducing fear among potential victims. Defensible Space Theory complements these by addressing the social and psychological dimension of environmental design. It explains how spatial arrangements and maintenance practices influence territoriality, guardianship, and collective responsibility.

Fear-scape functions as the integrative lens that binds these theories together. It translates spatial vulnerability into lived emotional experience, allowing crime patterning, situational opportunity, and territorial control to be understood through the perceptions of campus

users. By centring fear as an outcome of environmental interaction, the framework moves beyond explaining where crime occurs to explaining how insecurity is produced, sustained, and potentially dismantled.

Together, these three frameworks form an integrated analytical triad: Environmental Criminology diagnoses spatial vulnerability, SCP prescribes situational strategies for mitigation, and DST embeds these measures within a framework of social cohesion and environmental ownership. Their combined application in this study offers a holistic understanding of fear-scape at the University of Benin by linking physical design, behavioural response, and community perception into one coherent model of spatial safety. See Figure 1 for the interrelatedness of the theories.

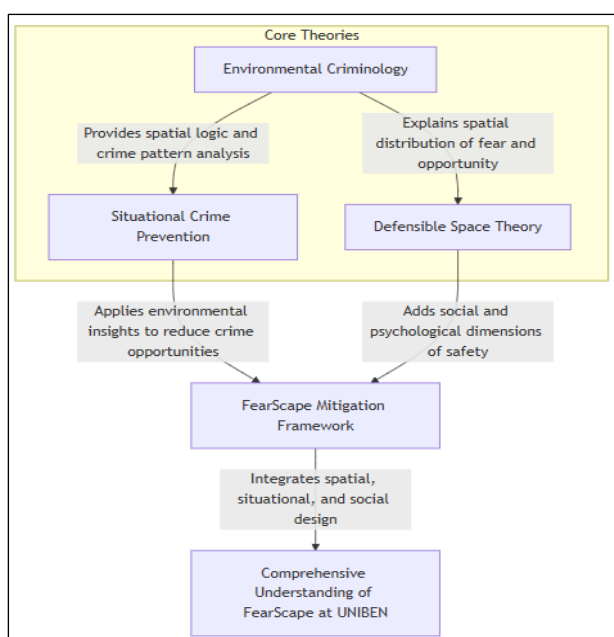


Figure 1: Interrelatedness Environmental Criminology, Situational Crime and Defensible Space Theories (Source: Authors’ Abstraction, 2025)

Literature review

The literature review for this study was organised thematically under these headings to provide a coherent understanding of the concept of fear-scape and its contextual relevance to university environments. These headings are: defining the fear-scape, factors contributing to fear, insecurity and its causes, impact of fear on campus life, economic and social implications, and vulnerable demographics.

Defining the fear-scape

The term fear-scape captures how particular environments trigger anxiety, caution, or avoidance even when no direct threat is present. Valentine (1989) showed that women’s movement through public space is shaped less by crime statistics and more by perceived

vulnerability. Later work treated the fear-scape as both a social and psychological construct embedded in the built environment (Pain, 2000). Lorenc et al. (2012) noted that fear often exceeds actual risk because environmental cues and social experiences symbolically signal danger. Tarus (2025) reported similar patterns among university students, whose sense of exposure heightened emotional fear.

Empirical studies show that fear-scapes appear in unlit parks, deserted streets, and isolated estates marked by poor visibility and weak maintenance (Day, 2001; Mehta, 2013). University campuses display the same shift from daytime openness to nocturnal anxiety (Fisher & Nasar, 1992; Zeng et al., 2025). In Nigeria, Berebon (2023) links campus fear to limited surveillance and failing infrastructure, while Roberts (2022) finds that even advanced settings experience fear when visibility and guardianship are low.

Factors contributing to fear

Across many studies, environmental design stands out as the strongest driver of fear perception. Poor lighting, dense vegetation, blocked sightlines, and unclear signage all heighten anxiety in both urban and campus settings (Ekblom, 1997; Mehta, 2013). In residential estates, low visibility and limited foot traffic create a sense of vulnerability even where actual crime is minimal (Day, 2001). Parks and recreation areas shift into fear zones when isolation and neglect signal weak control or oversight (Valentine, 1989). Signs of disorder such as graffiti, litter, and broken infrastructure often intensify unease by implying abandonment. Huang et al. (2022) add further evidence from South China, showing that weak natural surveillance and poor environmental cues significantly shape students’ sense of danger.

Social and psychological factors deepen these responses. Memory, media, and shared narratives all influence how people appraise risk (Pain, 2000; Mehta, 2013). Prior victimisation or exposure to second-hand stories can elevate fear beyond actual threat. Gender plays a consistent role: women, especially younger women, report stronger fear and avoid more spaces than men (Maier & DePrince, 2019). Tarus (2025) found similar patterns among students, with older and female respondents expressing heightened concern about physical and sexual victimisation. Fisher & May (2009) noted that some cues prompt fear for everyone, while others are gender-specific. In Nigeria, Anyanwu et al. (2023) show how rumours, cult violence, and harassment reports shape movement more powerfully than crime statistics.

Impact of fear on campus life

Fear carries serious consequences for academic and social life. Fisher & Nasar (1992) showed that when students believe their campus is unsafe, they change how

they move through space, avoiding night lectures, libraries, and informal gatherings. Mkhize et al. (2022) observed that these shifts gradually fracture the university community by weakening everyday interaction and trust. Pain (2000) added that the emotional strain of persistent fear can erode concentration, participation, and general well-being. Mehta (2013) reported similar dynamics in public parks where perceived insecurity discouraged recreational use, producing social withdrawal and a decline in the vitality of shared spaces. Roberts (2022) found that students in the UK avoid bus stops, lecture corridors, and dimly lit paths, showing that these behavioural responses occur across diverse contexts. Fear restricts mobility and reduces emotional investment in communal environments.

In Nigeria, these impacts intensify due to chronic infrastructural gaps. Ekpoh et al. (2020) noted that poor lighting, unreliable electricity, and weak patrol systems discourage night study and limit social engagement. Anyanwu et al. (2023) found that many students abandon reading halls at dusk and retreat to crowded dormitories or off-campus hostels. Adebamiwa (n.d.) argues that fear-driven avoidance deepens inequalities in academic participation between students with different security and residential conditions. Similar patterns appear in residential neighbourhoods and industrial zones, where perceived insecurity suppresses evening activity and undermines community cohesion.

Economic and social implications

Fear imposes heavy economic and social costs on individuals and institutions. On university campuses, insecurity forces administrators to redirect resources from teaching and research towards surveillance, patrols, and infrastructure repair (Ilori et al., 2024). Institutions viewed as unsafe face reputational setbacks, making it harder to attract staff, students, and external partners. Mehta (2013) noted that public spaces linked with danger often experience economic stagnation, as businesses close early and property values decline. Valentine (1989) and Day (2001) similarly observed that fear-driven avoidance drains urban spaces of vibrancy, reducing informal interaction and limiting local economic activity. Nigerian universities face comparable challenges. Concerns about safety influence enrolment choices, discourage evening commerce, and weaken investment in campus entrepreneurship (GCPEA, 2024). Ajadi (2025) further argues that students' satisfaction and full engagement depend on how confident they feel in existing security systems.

The social implications are equally severe. Persistent fear weakens trust, reduces cohesion, and fragments communal identity. In estates and industrial areas, avoidance of public spaces leads to fragile neighbourly ties and heightened suspicion (Piscitelli & Perrella, 2017; Reichert & Konefal, 2017). On campuses, this isolation undermines peer support, mentorship, and collaborative

study culture (Anyanwu, 2023). Tarus (2025) shows that fear is highest among off-campus residents, illustrating how weak surveillance and limited community presence deepen social disconnection. Over time, fear reshapes movement and erodes the social fabric of the institution, making collective responsibility harder to sustain.

Fear mapping

Fear mapping has emerged as a critical approach for understanding how perceptions of insecurity are distributed across space and how these perceptions relate to environmental conditions, crime patterns, and everyday behaviour. Rather than treating fear as a purely psychological state, this body of literature conceptualises fear as spatially produced, locally anchored, and unevenly experienced.

Jakobi & Pődör (2020) provide one of the clearest demonstrations of how fear can be spatially captured and analysed. Their study combined digital sketch maps with GIS-based statistical techniques to examine fear of crime across Hungarian cities of different sizes. Residents used a web-based mapping tool to identify places where they felt safe or fearful. These subjective markings were transformed into grid-based spatial data, allowing systematic comparison across cities. The results revealed both alignments and mismatches between official crime statistics and perceived unsafe locations. Importantly, the study showed that neither city size nor respondents' sex significantly shaped overall judgements of place. Instead, local crime intensity and the concentration of fear or safety markings were more influential. This finding reinforces the argument that fear is highly contextual and rooted in specific spatial conditions rather than broad demographic categories.

Building on this spatial-perceptual nexus, Pődör & Tick (2025) advance fear mapping through a geoinformatics-based methodology that links subjective safety perceptions with the spatial distribution of CCTV infrastructure. Their work recognises fear of crime as inherently subjective, shaped by time, place, personal disposition, and situational cues. Using quantitative spatial analysis, they demonstrate a significant relationship between areas perceived as dangerous and the placement of security cameras. This suggests that security infrastructure does not merely respond to crime but also reflects and potentially reinforces collective perceptions of danger. Their contribution is methodological as much as substantive, showing how digital spatial tools can translate subjective fear into measurable, policy-relevant data.

Within the Nigerian context, Oluwadare & Eyinade (2025) extend fear mapping principles to campus environments by applying GIS techniques to analyse crime patterns at Obafemi Awolowo University. Although their study focuses on recorded crime rather than perceived fear, it provides an essential spatial baseline for fear-scape analysis. Using spatial autocorrelation and

hotspot analysis, they demonstrate that crime incidents on campus are clustered rather than random, with theft concentrated around academic buildings and residential halls. The identification of clear hotspots highlights how specific campus zones become spatially associated with risk. For fear mapping research, this underscores the importance of integrating perceived fear with spatial crime data to understand how objective and subjective risks intersect in institutional spaces.

Curtis (2012) offers a critical methodological reflection that situates fear mapping within a broader intellectual trajectory. The study reviews how GIS has been used to examine fear of crime, particularly through the integration of sketch maps. Curtis argues that while GIS has expanded the analytical reach of fear research, it has not automatically resolved the complex relationship between environmental perception and behavioural response. Sketch maps, when combined with GIS, offer a valuable bridge between subjective experience and spatial analysis. However, Curtis cautions that this approach carries conceptual and technical challenges, including variability in interpretation, scale, and meaning. The strength of fear mapping, therefore, lies not in technical sophistication alone but in careful theoretical grounding and methodological transparency.

Taken together, these studies establish fear mapping as a powerful framework for examining how fear is produced, located, and sustained within urban and institutional environments. They demonstrate that fear is neither random nor purely individual. It is shaped by local spatial conditions, environmental cues, security infrastructures, and everyday practices. This literature provides a strong foundation for analysing fear-scapes within university campuses, where mobility, time of day, land use, and surveillance intersect to structure both perceived and lived insecurity.

Research gap

Existing empirical studies on fear in campuses and public spaces have provided useful insights but remain limited in scope, depth, and methodological rigour. Earlier works such as Valentine (1989), Pain (2000) and Mehta (2013) established that fear is spatially patterned and socially constructed, yet their analyses were largely descriptive and concentrated in Western contexts with advanced infrastructure. While Fisher & Nasar (1992) mapped fear “hotspots” on American campuses, they did not sufficiently account for the socio-economic realities of developing regions where insecurity is institutional and systemic. Studies in Nigeria, including Ilori et al. (2024) and Anyanwu et al. (2023), provided important contextual understanding but stopped short of spatially visualising fear or identifying specific high-risk zones. They treated fear as a by-product of insecurity rather than an independent spatial phenomenon shaped by behavioural and environmental interactions.

Moreover, existing literature has tended to emphasise gender disparities in fear perception without systematically exploring how these intersect with other variables such as residential location, marital status, or time of day. For instance, while Pain (2000) and Zeng et al. (2025) acknowledge that women experience heightened fear in poorly lit environments, few Nigerian studies have empirically tested this association using statistical models or spatial analysis. The lack of quantitative mapping and comparative temporal assessment of day versus night fear creates a significant knowledge gap. Consequently, interventions proposed in prior research remain general, lacking the precision needed to target context-specific fear zones.

While previous studies described fear, this study measured, mapped, and explained it. The study moved beyond narrative accounts to spatial-quantitative analysis, showing how demographic, environmental, and temporal variables interact to shape fear-scape in a Nigerian university. By linking perception data to spatial evidence, it advances understanding of campus insecurity from a generalised discourse to a data-driven framework, providing a replicable model for other institutions in sub-Saharan Africa.

Study area

The study area is the University of Benin (UNIBEN), located within latitudes 6°23'30"N to 6°24'30"N and longitudes 5°36'30"E to 5°38'0"E. Geographically, the university spans two local government areas Egor and Ovia North East within Benin City, Edo State, Nigeria (Fig. 2). The university occupies a strategic position along the Benin–Lagos expressway, serving as both an academic hub and a major urban landmark. The terrain is predominantly flat, with built-up zones interspersed by patches of vegetation and open spaces that define its physical layout. The institution shares boundaries with Ekosodin community to the north, the University of Benin Teaching Hospital (UBTH) to the south, the Edo Development Property Agency (EDPA) Estate to the west, and Ekiuwa and Edosowan communities to the east.

Founded in 1970 as the Institute of Technology, the University of Benin was accredited as a full-fledged university by the National Universities Commission (NUC) in 1971 and formally renamed in 1972. It became a federal institution shortly thereafter.

Over the decades, UNIBEN has grown into one of Nigeria’s foremost public universities, with a diverse academic structure comprising faculties such as Arts, Agriculture, Education, Engineering, Law, Life Sciences, Pharmacy, Physical Sciences, Social Sciences, Environmental Sciences, and the College of Medical Sciences. The latter encompasses the Schools of Dentistry, Medicine, Basic Medical Sciences, and the Institute of Child Health.

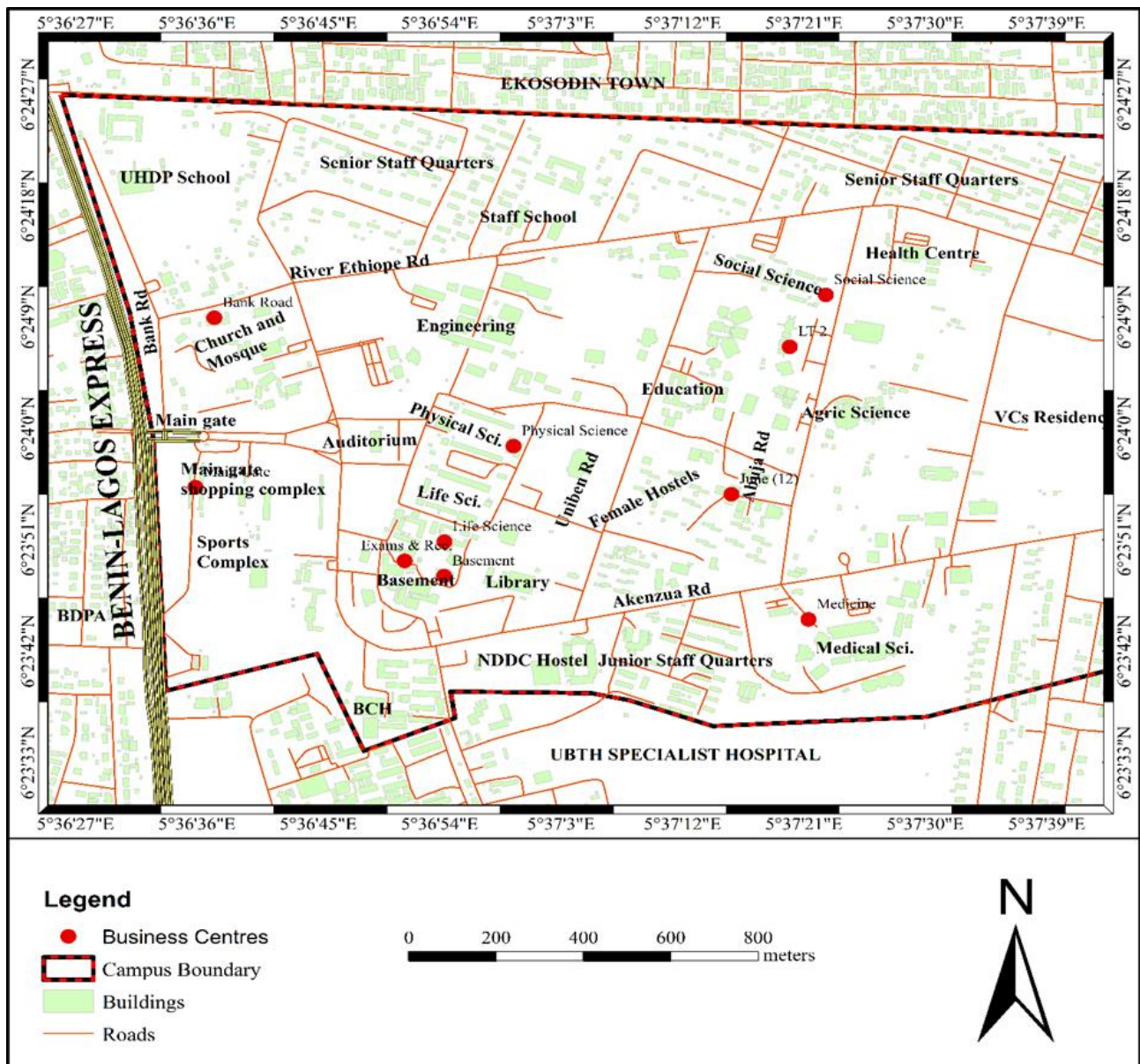


Figure 2: University of Benin (Source: Open Street Map and Edited by Authors, 2025)

The main campus at Ugbowo houses most faculties and administrative offices, accommodating an estimated 46,000 students enrolled in both full-time and part-time programmes. The university employs between 4,100 and 5,000 staff, including academic and non-academic personnel (University of Benin, Student Information Handbook, 2022). In addition to the Ugbowo Campus, UNIBEN operates satellite campuses such as the Ekenhuan Campus, home to the Faculty of Arts, and the College of Petroleum and Gas Engineering located in Effurun, near Warri, Delta State.

Beyond its academic functions, the university sustains a network of ancillary services commercial enterprises, cyber cafés, transportation systems, and light manufacturing activities that contribute to the daily life of the campus community. These services are largely managed by non-teaching staff and small-scale operators.

The combination of educational and socio-economic activities makes UNIBEN a dynamic urban microcosm, offering a representative setting for examining the spatial and psychological dimensions of fear within institutional environments.

Methodology

This study employed an embedded mixed-method research design to investigate the fear-scape of the University of Benin's Ugbowo Campus. The quantitative component formed the dominant strand, providing measurable indicators of fear across space, while qualitative narratives were embedded to deepen understanding of the emotional and behavioural implications of fear. This design was appropriate because fear is both a spatially quantifiable phenomenon and a

subjective experience requiring contextual interpretation. Quantitative data were collected through structured questionnaires that measured perceived insecurity across selected campus locations, whereas qualitative insights were derived from open-ended responses describing students' personal encounters, anxieties, and coping strategies.

Primary data constituted the core evidence for the study and were collected using a structured questionnaire administered to 387 respondents sampled across different user groups, including students, academic and non-academic staff, shop owners, and shuttle drivers. The sample size of 387 was determined to provide adequate statistical power and spatial coverage across the campus zones, ensuring that observed variations in fear perception were not artefacts of under-representation. To ensure that respondents evaluated all 30 predetermined campus locations consistently, short video clips (ten seconds each for day and night) were recorded to standardise visual exposure.

Participants viewed these videos before rating their level of fear on a five-point scale (0 = no fear to 5 = very high fear). Fear levels were operationalised as ordinal categories along this scale, where higher values indicated increasing perceived vulnerability and threat. The videos aided recall and reduced subjective bias arising from uneven familiarity with campus locations. GPS coordinates and field observations were collected concurrently to support spatial mapping. Secondary data, including institutional documents and academic literature, supplemented primary findings and provided contextual grounding.

Sampling followed the spatial stratification used by the University of Benin Security Unit, which divides the campus into 17 operational zones for surveillance. This framework ensured comprehensive geographic coverage and allowed the study to capture variations in fear across different land-use types. Systematic sampling was employed within each zone, with questionnaire administered to every third person encountered. Due to the higher human density in Zones A and B, 27 respondents were selected from each. Zone C had 25 respondents, while Zones D through Q each had 22 respondents, bringing the total to 387. This zonal allocation ensured proportional spatial distribution of respondents across academic, residential, commercial, and transit areas of the campus. This combination of zonal stratification and systematic interval selection enhanced representativeness and ensured that respondents reflected the diversity of daily users across academic, residential, commercial, and transit spaces.

Data analysis combined descriptive and inferential statistical procedures. Descriptive statistics summarised respondents' sociodemographic attributes and overall fear ratings. Inferential analyses were performed to examine variations in fear across demographic and spatial factors. Multivariate Analysis of Variance

MANOVA compared fear levels across residential categories; correlations identified the relation between perceptions of fear, security, and safety across day and night periods; and multiple linear regression identified predictors of fear among demographic and locational variables. Spatial data were analysed using Kernel Density Estimation (KDE) in ArcGIS to map day-time and night-time fear-scape, allowing visual identification of hotspots and transition zones. Data collection was conducted during the academic semester, with day-time and night-time ratings explicitly distinguished to capture temporal variation in fear perception. The qualitative component used thematic narrative analysis to interpret respondents' open-ended descriptions of fear, emphasising how emotional responses and daily routines intersect with spatial conditions. Together, these methods produced a detailed and multidimensional understanding of fear within the campus environment.

To strengthen conceptual clarity, sociodemographic variables such as sex, age, occupation, marital status, and residential location were operationalised as categorical indicators of social position and everyday exposure to campus space, based on prior fear-of-crime and environmental criminology literature. These categories were constructed to reflect meaningful differences in mobility patterns, spatial familiarity, and vulnerability, and were explicitly linked to spatial units used in the KDE analysis.

Before applying ANOVA and MANOVA, key statistical assumptions including independence of observations, homogeneity of variance, and multivariate normality were assessed and found to be acceptable for the data structure. Model specifications were guided by theoretical expectations, and effect sizes were reported alongside significance values to allow interpretation of the practical, not merely statistical, importance of observed differences.

Data Processing

All spatial analyses were conducted using ArcGIS 11.0 software. Survey responses capturing fear perception were georeferenced and digitised as point features corresponding to respondents' reported locations across the campus, including specific buildings, pathways, hostels, and well-known landmarks such as the June 12 area, Halls 1–7, the ICT Centre, faculties, and major circulation corridors. Each point therefore represents a spatially explicit fear observation site.

To capture temporal variation in fear perception, day-time and night-time fear ratings were processed separately, with distinct attribute fields created for each temporal condition. This separation enabled independent spatial analyses and direct comparison between day-time and night-time fear-scapes without aggregation bias. Supporting spatial layers, including campus road networks and key infrastructure, were incorporated to provide contextual reference and to aid interpretation of

observed patterns. All datasets were projected into a common coordinate reference system to ensure spatial consistency, accurate distance calculations, and comparability across outputs. Data processing and analysis were undertaken during the academic semester to reflect periods of active campus occupancy and typical movement patterns.

To visualise the spatial distribution of perceived fear, KDE was applied using the Kernel Density tool within the Spatial Analyst extension of ArcGIS. KDE was selected for its effectiveness in transforming discrete point-based perception data into continuous density surfaces (“fear-scapes”), thereby reducing visual clutter and clearly highlighting hotspots (areas of elevated fear), cold spots (low-fear zones), and transitional gradients. Two KDE surfaces were generated: Map 1 represents the day-time fear-scape constructed using only day-time fear ratings as the weighted population field, while Map 2 represents the night-time fear-scape generated from night-time ratings processed independently. In both cases, KDE computed density values as the weighted sum of influences from nearby points within a defined neighbourhood, producing a smoothed raster surface in which higher values indicate greater concentration and/or intensity of reported fear.

The KDE procedure employed a quartic (biweight) kernel function, the default in ArcGIS, which fits a smoothly tapered surface over each georeferenced point and applies a gradual decline in influence with distance until it reaches zero at the edge of the search radius. The search radius (bandwidth) was automatically determined using ArcGIS’s adaptive bandwidth algorithm, based on a two-dimensional adaptation of Silverman’s rule-of-thumb that incorporates weighted standard distance and median distance from the mean centre. This approach reduces sensitivity to outliers and prevents excessive smoothing or artificial ring effects, which is particularly important for campus-scale spatial analyses.

The output cell size was automatically generated by ArcGIS to balance spatial resolution and computational efficiency, appropriate for the approximately 1–2 km spatial extent of the study area. Density values were scaled according to the linear units of the projected coordinate system and adjusted for interpretability (e.g., per square kilometre), ensuring consistency across the day-time and night-time maps.

The resulting KDE raster surfaces were visualised using graduated colour symbology and classified with the Natural Breaks (Jenks) optimisation method. This classification technique minimises variance within classes while maximising differences between classes, allowing natural groupings in fear intensity to be clearly expressed. Six classes were typically applied, using a cool-to-warm colour progression in which green tones represent low fear intensity, yellow denotes moderate levels, and orange to red indicate high-intensity fear hotspots.

Data Presentation

Table 1 presents the sociodemographic characteristics of the 387 respondents who participated in the study. The variables summarised include sex, age, occupation, marital status, and place of residence. These characteristics provide essential context for interpreting patterns of fear perception across different groups within the university community, highlighting the diversity of campus users represented in the sample.

Table 1: Sociodemographic characteristics of respondents

Variable	Category	Frequency (N)	Percentage (%)
Sex	Male	254	65.6
	Female	133	34.4
Age (Years)	17–23	174	45.0
	24–30	109	28.2
	31–37	50	12.9
	38–44	43	11.1
	45 & Above	11	2.8
Occupation	Student	238	61.5
	Non-Teaching Staff	83	21.4
	Shop Owner	56	14.5
	Teaching Staff	7	1.8
	Shuttle/Taxi Driver	3	0.8
Marital Status	Single	282	72.9
	Married	99	25.6
	Widowed	6	1.6
Residence	On-Campus	260	61.2
	Off-Campus	127	32.8

Source: Authors’ Computation, 2025

The study population covered all categories of campus users, although students formed the largest share, which reflects their natural dominance within the university environment. They were followed by non-teaching staff, shop owners, teaching staff, and a few shuttle drivers. The sampling approach was purposive, designed to capture a balanced mix of individuals across age, gender, and occupational groups. Men formed a larger share of the respondents than women, and most participants were within the younger age bracket typical of undergraduate students.

This spread of respondents strengthened the dataset because it allowed the study to explore how different users interpret and experience fear across the campus, shaped by their varied social roles and daily movement patterns.

Results and discussion

Residential location on campus and perception of campus vigilance

Multivariate Analysis of Variance MANOVA was used to test the hypothesis that states that Students’ residential location does not have a statistically significant effect on their perceptions of fear, campus

security, and campus safety. Tables 2 and 3 present the relationship between students' residential location and their perceptions of fear, campus security, and safety, collectively termed campus vigilance. Table 2 displays the multivariate analysis of variance (MANOVA), while Table 3 provides follow-up tests of between-subjects effects for each dependent variable individually.

MANOVA was employed because the study examines multiple interrelated dependent variables simultaneously. Fear, security, and safety are

conceptually distinct but correlated aspects of campus vigilance. Using MANOVA allows the analysis to account for these intercorrelations, reducing the risk of Type I error that would arise if separate ANOVAs were conducted for each outcome. It also assesses whether residential location has a combined effect on the set of dependent variables, providing a more holistic understanding of how living on- or off-campus influences students' perception of campus safety.

Table 2: Multivariate analysis of the effect of residential location on fear perception and campus vigilance (fear, security and safety) ratings

	Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.941	515.610 ^b	6.000	193.000	.000	.941
	Wilks' Lambda	.059	515.610 ^b	6.000	193.000	.000	.941
	Hotelling's Trace	16.029	515.610 ^b	6.000	193.000	.000	.941
	Roy's Largest Root	16.029	515.610 ^b	6.000	193.000	.000	.941
Location residence	Pillai's Trace	1.034	3.749	66.000	1188.000	.000	.172
	Wilks' Lambda	.280	4.228	66.000	1038.170	.000	.191
	Hotelling's Trace	1.635	4.740	66.000	1148.000	.000	.214
	Roy's Largest Root	1.006	18.114 ^c	11.000	198.000	.000	.502

a. Design: Intercept + Location residence; b. Exact statistic; c. The statistic is an upper bound on F that yields a lower bound on the significance level

Source: Authors' Computation, 2025

The results presented in Table 2 empirically demonstrate that residential location significantly influences students' fear perception and security ratings at the University of Benin. Multivariate test statistics which included Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root, consistently indicated a statistically significant effect of residential location on the combined measures of fear and perceived security ($p < .001$). These outcomes confirm that variations in fear perception are systematically associated with where students reside on campus rather than occurring randomly.

Further empirical evidence from the between-subjects analyses shows that day-time fear and security ratings differ significantly across residential locations ($F = 4.678, p < .001$ for fear; $F = 5.474, p < .001$ for security). The associated partial eta squared values indicate moderate effect sizes, suggesting that residential location exerts a meaningful, though not exclusive, influence on fear perception. Post hoc multiple comparisons further reveal that students residing in Halls 2, 6, and the Junior Staff Quarters report higher fear levels, particularly at night, compared to residents of Keystone and Hall 1, while some locations (e.g., Halls 3 and 5) do not differ significantly. Notably, night-time effects are more pronounced, reinforcing the temporal dimension of fear observed across the campus.

Interpreting these empirical patterns, the findings are consistent with defensible space theory, which posits that spatial design, visibility, and territorial control shape perceptions of safety (Newman, 1972). Residential areas

reporting higher fear levels may be characterised by weaker natural surveillance, limited lighting, or less controlled access, although these environmental attributes were not directly measured in this analysis. Similarly, the stronger night-time effects align with environmental criminology perspectives that emphasise how situational conditions such as low visibility and reduced pedestrian activity amplify perceived risk (Painter & Farrington, 1999; Cozens et al., 2005). Importantly, the moderate effect sizes support Farrington & Welsh's (2007) argument that environmental conditions influence fear but do not fully determine it, indicating that individual experience and social context also play a role.

From a policy and planning perspective, these findings suggest that fear on campus is both spatially and temporally mediated rather than purely individual. Residential locations identified as high-fear areas particularly those exhibiting elevated night-time fear represent priority zones for targeted intervention. Measures such as improved lighting, clearer sightlines, enhanced access control, and strengthened natural surveillance could mitigate perceived vulnerability in these locations.

In addition, differential fear patterns across halls indicate that uniform security strategies may be less effective than location-specific interventions. By aligning environmental design and security management with empirically identified fear hotspots, university authorities can more effectively reduce perceived insecurity and improve students' overall sense of safety.

Table 3: Tests of between-subjects effects of residential location on fear and campus vigilance (fear, security and safety) ratings

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected model	Rating of Fear Level During the Day	80.200 ^a	11	7.291	4.678	.000	.206
	Rating of Fear Level During the Night	56.251 ^b	11	5.114	3.288	.000	.154
	Rating of Security of Campus During Day	47.867 ^c	11	4.352	5.474	.000	.233
	Rating of Security of Campus During Night	84.980 ^d	11	7.725	4.911	.000	.214
	Rating of Safety of the Campus During the Day	59.944 ^e	11	5.449	3.508	.000	.163
	Rating of Safety of the Campus During the Night	61.921 ^f	11	5.629	3.603	.000	.167
Intercept	Rating of Fear Level During the Day	113.016	1	113.016	72.517	.000	.268
	Rating of Fear Level During the Night	1227.049	1	1227.049	788.912	.000	.799
	Rating of Security of Campus During Day	1113.365	1	1113.365	1400.424	.000	.876
	Rating of Security of Campus During Night	245.698	1	245.698	156.202	.000	.441
	Rating of Safety of the Campus During the Day	1260.626	1	1260.626	811.396	.000	.804
	Rating of Safety of the Campus During the Night	253.126	1	253.126	162.009	.000	.450
Location residence	Rating of Fear Level During the Day	80.200	11	7.291	4.678	.000	.206
	Rating of Fear Level During the Night	56.251	11	5.114	3.288	.000	.154
	Rating of Security of Campus During Day	47.867	11	4.352	5.474	.000	.233
	Rating of Security of Campus During Night	84.980	11	7.725	4.911	.000	.214
	Rating of Safety of the Campus During the Day	59.944	11	5.449	3.508	.000	.163
	Rating of Safety of the Campus During the Night	61.921	11	5.629	3.603	.000	.167
Error	Rating of Fear Level During the Day	308.581	198	1.558			
	Rating of Fear Level During the Night	307.963	198	1.555			
	Rating of Security of Campus During Day	157.414	198	.795			
	Rating of Security of Campus During Night	311.443	198	1.573			
	Rating of Safety of the Campus During the Day	307.623	198	1.554			
	Rating of Safety of the Campus During the Night	309.360	198	1.562			
Total	Rating of Fear Level During the Day	654.000	210				
	Rating of Fear Level During the Night	3151.000	210				
	Rating of Security of Campus During Day	2891.000	210				
	Rating of Security of Campus During Night	1117.000	210				
	Rating of Safety of the Campus During the Day	3039.000	210				
	Rating of Safety of the Campus During the Night	1137.000	210				
Corrected Total	Rating of Fear Level During the Day	388.781	209				
	Rating of Fear Level During the Night	364.214	209				
	Rating of Security of Campus During Day	205.281	209				
	Rating of Security of Campus During Night	396.424	209				
	Rating of Safety of the Campus During the Day	367.567	209				
	Rating of Safety of the Campus During the Night	371.281	209				

a. *R Squared* = .206 (*Adjusted R Squared* = .162); b. *R Squared* = .154 (*Adjusted R Squared* = .107); c. *R Squared* = .233 (*Adjusted R Squared* = .191)
 d. *R Squared* = .214 (*Adjusted R Squared* = .171); e. *R Squared* = .163 (*Adjusted R Squared* = .117); f. *R Squared* = .167 (*Adjusted R Squared* = .120)

Source: Authors' Computation, 2025

Temporal dynamics of fear in the campus environment

Spearman correlation was used to test the hypothesis that states that “there is no statistically significant association between perceptions of fear, security, and safety across day and night periods on the University of Benin campus.” Table 4 presents the Spearman correlation matrix used to examine how fear, security, and safety perceptions relate to one another across diurnal and nocturnal periods on the University of Benin campus. Correlation analysis was appropriate here because the variables are ordinal ratings derived from Likert-type scales, which do not meet the assumptions of

normality required for parametric tests. Spearman's *rho*, a non-parametric measure, allows us to determine both the strength and direction of association between these perception variables without assuming linearity or equal intervals between scale points. This approach makes it possible to identify whether increases in fear correspond with decreases in perceived security and safety, and how these relationships shift between day and night.

The correlation analysis empirically reveals a consistent pattern in fear perception across temporal and environmental dimensions on the UNIBEN campus. A positive correlation between day-time and night-time fear indicated that students who report higher fear during the day also tend to report elevated fear at night.

The moderate strength of this relationship suggests continuity in fear perception across time periods, rather than fear emerging exclusively under night-time conditions. Additionally, statistically significant negative correlations between fear and security or safety ratings indicated that as perceived fear increases, students' assessment of campus security and safety correspondingly declines. These inverse relationships are strongest for night-time conditions, particularly between night-time fear and night-time security ($r = -.401$), highlighting the heightened sensitivity of fear to environmental cues after dark. Strong positive correlations between security and safety ratings during both day-time ($r = .741$) and night-time ($r = .826$) further demonstrate internal consistency in respondents' evaluations of protective campus conditions.

Interpreting these empirical patterns, the persistence of fear from day to night supports Pain's (2000) argument that fear is cumulative and socially learned, shaped by prior experiences and shared narratives rather than isolated events. The observed inverse relationship between fear and perceived security aligns with Environmental Criminology, which posits that individuals infer risk from environmental signals such as poor visibility, obstructed sightlines, weak guardianship, and limited formal or informal surveillance (Brantingham & Brantingham, 1981; Day, 2001; Mehta, 2013).

The stronger night-time correlations suggest that these environmental cues become more salient under conditions of reduced visibility, amplifying existing psychological vulnerability rather than creating fear de novo. Furthermore, the strong positive association between security and safety ratings is consistent with Defensible Space Theory, which emphasises that well-maintained, legible, and territorially defined environments foster emotional reassurance and perceived control.

From a policy and planning perspective, these findings indicated that fear on the UNIBEN campus is not merely an individual psychological response but a spatially and environmentally mediated phenomenon. Night-time conditions emerge as critical intervention periods, where deficiencies in lighting, maintenance, and visible guardianship disproportionately affect perceived safety. Targeted improvements in illumination, vegetation management, pathway visibility, and the visibility of security patrols particularly in locations already identified as high-fear areas could significantly reduce fear and strengthen students' confidence in campus safety. By addressing both the physical environment and its communicative signals, campus authorities can disrupt the cycle through which fear persists across time and space, reinforcing the role of environmental design and management as central tools in fear reduction strategies.

Table 4: Correlation analysis of diurnal fear, security and safety ratings

			Rating of Fear Level During the Day	Rating of Fear Level During the Night	Rating of Security of Campus During Day	Rating of Security of Campus During Night	Rating of Safety of the Campus During the Day	Rating of Safety of the Campus During the Night
Spearman's rho	Rating of Fear Level During the Day	Correlation Coefficient	1.000	.351**	-.226**	-.141**	-.208**	-.216**
		Sig. (2-tailed)	.	.000	.000	.006	.000	.000
		N	387	387	387	387	387	387
	Rating of Fear Level During the Night	Correlation Coefficient	.351**	1.000	-.133**	-.401**	-.215**	-.371**
		Sig. (2-tailed)	.000	.	.009	.000	.000	.000
		N	387	387	387	387	387	387
	Rating of Security of Campus During Day	Correlation Coefficient	-.226**	-.133**	1.000	.401**	.741**	.354**
		Sig. (2-tailed)	.000	.009	.	.000	.000	.000
		N	387	387	387	387	387	387
	Rating of Security of Campus During Night	Correlation Coefficient	-.141**	-.401**	.401**	1.000	.356**	.826**
		Sig. (2-tailed)	.006	.000	.000	.	.000	.000
		N	387	387	387	387	387	387
	Rating of Safety of the Campus During the Day	Correlation Coefficient	-.208**	-.215**	.741**	.356**	1.000	.355**
		Sig. (2-tailed)	.000	.000	.000	.000	.	.000
		N	387	387	387	387	387	387
	Rating of Safety of the Campus During the Night	Correlation Coefficient	-.216**	-.371**	.354**	.826**	.355**	1.000
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.
		N	387	387	387	387	387	387

** Correlation is significant at the 0.01 level (2-tailed)

Source: Author's Computation, 2025

Factors influencing fear

Multiple linear regression was used to test the hypothesis that states that “Demographic characteristics and residential location do not significantly predict overall fear levels among campus users at the University of Benin”. Tables 5 to 7 present the results of the multiple linear regression analysis used to examine how selected demographic and residential factors predict overall fear levels on the University of Benin campus. Table 5 summarises the model fit and shows that the combined predictors explain a modest but statistically meaningful

proportion of variation in fear perception, indicating that fear is not randomly distributed across campus users. Table 6 reports the ANOVA results, confirming that the regression model is statistically significant and that the predictors jointly contribute to explaining differences in overall fear levels. Table 7 disaggregates this relationship by showing the individual contribution of each predictor, identifying which variables significantly influence fear perception and which do not. Taken together, these tables provide a structured basis for understanding how demographic position and residential status shape students’ and users’ experiences of fear on campus.

Table 5: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.361 ^a	.130	.119	1.63278	.130	11.365	5	380	.000

a. Predictors: (Constant), Campus Resident, Gender of Respondent, Marital Status of Respondent, Occupation of Respondent, Age of Respondent
 Source: Author’s Computation, 2025

Table 6: ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	151.499	5	30.300	11.365	.000 ^b
Residual	1013.063	380	2.666		
Total	1164.562	385			

a. Dependent Variable: Overall Fear Level on Campus; b. Predictors: (Constant), Campus Resident, Gender of Respondent, Marital Status of Respondent, Occupation of Respondent, Age of Respondent
 Source: Author’s Computation, 2025

Table 7: Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	4.026	.389		10.341	.000	3.261	4.792
	Gender of Respondent	.073	.191	.020	.382	.703	-.302	.447
	Age of Respondent	-.035	.019	-.153	-1.823	.069	-.073	.003
	Occupation of Respondent	.024	.122	.015	.201	.841	-.215	.264
	Marital Status of Respondent	.802	.243	.254	3.306	.001	.325	1.279
	Campus Resident	-1.226	.208	-.352	-5.882	.000	-1.635	-.816

a. Dependent Variable: Overall Fear Level on Campus
 Source: Author’s Computation, 2025

The regression analysis empirically demonstrates that demographic characteristics and residential context jointly predict students’ overall fear levels at the University of Benin, although with limited explanatory power. The model accounts for 13 percent of the variance in fear perception, indicating that while individual attributes contribute to fear, they explain only a modest proportion of students’ anxiety levels. This statistical outcome suggests that factors beyond personal characteristics particularly environmental and situational conditions play a more substantial role in shaping fear perception on campus.

Interpreting the significant predictors, marital status emerges as a strong positive determinant of fear, with

married respondents reporting higher overall fear levels. This pattern is consistent with Tarus (2025), who attributes heightened fear among married individuals to increased perceived responsibility and concern for dependents (responsibility-burden effect). From a theoretical standpoint, this supports Pain’s (2000) argument that fear is socially constructed and rooted in subjective vulnerability rather than direct exposure to crime alone. In contrast, campus residency functions as a significant negative predictor, indicating that students residing on campus experience lower fear levels than those living off campus. This finding aligns with Defensible Space Theory (Newman, 1972), which emphasises the protective role of territoriality, visibility,

and perceived ownership. Off-campus dwellers, often associate the campus environment to be of weaker surveillance, poorer lighting, and greater isolation, and this may generate what has been described as “ambient insecurity,” thereby elevating fear (Berebon, 2023; Anyanwu et al., 2023; Mehta, 2013; Huang et al., 2022).

The non-significance of gender, age, and occupation once marital status and residential location are controlled further indicates that commonly assumed demographic predictors lose explanatory power when environmental context is taken into account. This finding echoes Fisher & May (2009), who observed that demographic differences in fear are often mediated or overridden by situational and spatial conditions rather than operating independently.

From a policy and planning prism, the relatively low explained variance reinforces the conclusion that fear on campus is primarily context-driven rather than demographically determined. Interventions focused solely on individual-level characteristics are therefore unlikely to substantially reduce fear. Instead, the results point to the importance of addressing environmental fear generators such as poor lighting, spatial isolation, limited surveillance, and low levels of human activity. Targeted improvements to off-campus routes, transitional spaces, and residential peripheries—through enhanced lighting, increased patrol visibility, and improved spatial legibility—are likely to yield greater reductions in fear than demographic-specific strategies.

Overall, the regression findings strengthen the argument that campus fear is spatially patterned and environmentally produced, reinforcing Environmental Criminology’s emphasis on place-based solutions.

Spatial analysis of fear-scape

Figures 3 and 4 present the spatial distribution of fear on the UNIBEN Ugbowo Campus during the day and at night. They show how fear is not evenly spread but concentrated in specific pockets of the campus. Kernel Density Estimation was used because it provides a smooth, continuous surface that highlights where fear intensifies and where it declines. This matter because patterns of fear often emerge subtly, and KDE helps reveal these clusters in a way raw point data cannot. It also supports environmental criminology principles by allowing us to see how space shapes perception.

The maps that follow make these patterns visible and help identify the locations that require closer security attention.

The Kernel Density Estimation (KDE) surfaces empirically demonstrate that fear perception on the University of Benin campus is spatially patterned rather than random, reinforcing the quantitative results obtained from the correlation and regression analyses. Distinct day-time fear clusters are observed around the ICT Centre, Life Sciences complex, the Auditorium, and hostels near June 12 and Halls 1–3, while night-time

surfaces show intensified and expanded fear zones around Halls 1–5 and the Faculty of Agriculture. Conversely, locations such as UDSS, the Senior Staff Quarters, and the Anatomy Back Gate consistently exhibit low fear intensity across temporal periods. These spatial regularities complement the regression finding that environmental and locational factors explain fear more strongly than individual demographics, as well as the correlation results showing stronger fear–security relationships at night.

Interpreting these spatial patterns in light of the statistical findings, the KDE maps provide a visual explanation for the negative correlations between fear and perceived security/safety, particularly under night-time conditions. Areas exhibiting high KDE fear density correspond to locations where environmental cues such as poor lighting, obstructed sightlines, recessed entrances, and reduced surveillance likely weaken perceptions of security, consistent with the observed inverse relationship between night-time fear and night-time security ratings.

The persistence of fear clusters in busy day-time locations further aligns with the positive correlation between day-time and night-time fear, indicating that fear is cumulative rather than temporally isolated. Students who perceive insecurity in certain spaces during the day appear to carry this anxiety into the night, supporting Pain’s (2000) argument that fear is socially learned and reinforced through repeated exposure to perceived risk environments.

The KDE results also help contextualise the regression outcomes, particularly the limited explanatory power of demographic variables. The finding that residential location significantly predicts fear while gender, age, and occupation do not correspond with the spatial concentration of fear around specific hostels and residential corridors.

On-campus residential zones with weak territorial cues and inconsistent lighting exhibit higher fear densities, whereas areas characterised by clear boundaries, defined ownership, and visible guardianship consistently register lower fear. This spatial evidence supports Defensible Space Theory (Newman, 1972) and Environmental Criminology by demonstrating that place-based characteristics override individual attributes in structuring fear perception. Moreover, the intensified night-time fear surfaces visually reinforce the regression model’s implication that contextual conditions rather than personal traits drive fear escalation after dark. These findings resonate strongly with fear-mapping scholarship that employs spatial visualisation to bridge subjective perception and environmental structure. Studies using sketch maps and GIS-based fear surfaces demonstrate that fear consistently clusters in transitional and ambiguous spaces such as corridors, edges, and movement routes rather than within formally controlled interiors.

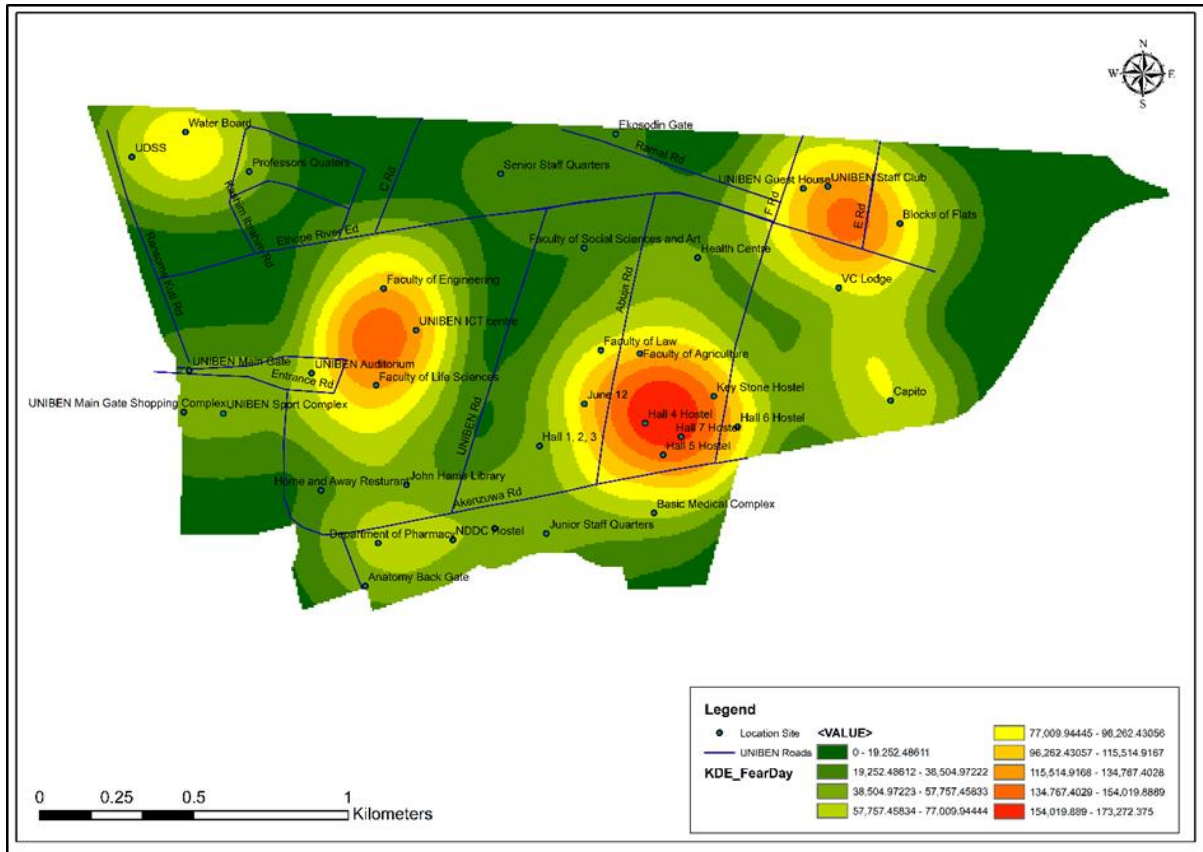


Figure 3: Day-Time Kernel density estimation of the Fear-Scope of UNIBEN, Ugbowo Campus (Source: Authors' Computation, 2025)

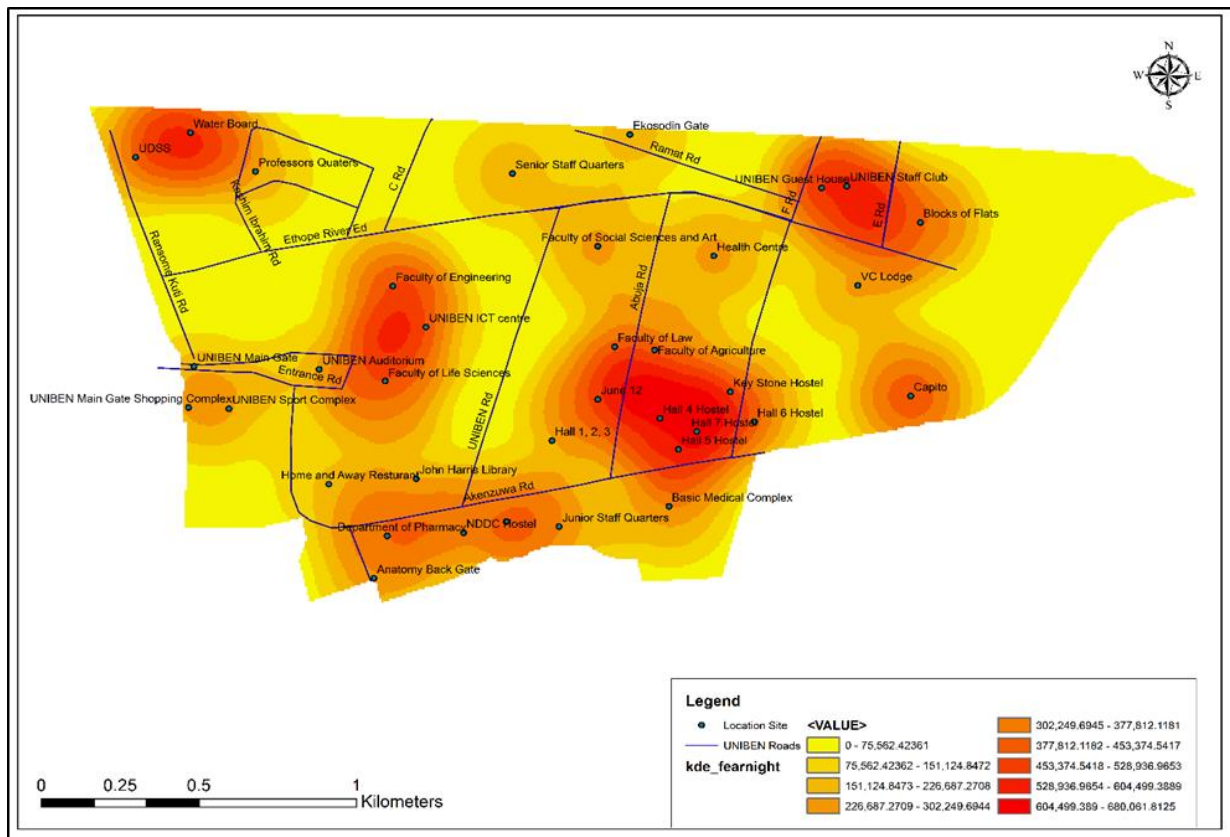


Figure 4: Night-Time Kernel density estimation of the Fear-Scope of UNIBEN, Ugbowo Campus (Source: Authors' Computation, 2025)

Similar to the grid-based fear models developed by Jakobi & Pödör (2020), the UNIBEN KDE surfaces show that perceived danger is shaped more by local spatial cues than by aggregate crime levels or personal attributes. The persistence of hotspots across temporal periods also reflects Curtis (2012) observation that fear maps capture stable perceptual geographies that guide everyday behaviour, not momentary emotional responses. By aligning KDE outputs with statistical associations and narrative accounts, this study advances fear-mapping literature beyond descriptive cartography, demonstrating how spatial representations can empirically validate behavioural avoidance, temporal fear escalation, and the dominance of place-based risk perception within institutional environments such as university campuses.

From a policy and planning view point, the convergence of spatial, correlational, and regression evidence underscores that fear on the UNIBEN Ugbowo campus is produced through the interaction of environmental design, surveillance, and temporal conditions. The KDE hotspots identify where statistically significant fear–security relationships are most likely to manifest spatially, while regression results clarify that interventions should prioritise environmental modification over demographic targeting. Targeted improvements in lighting consistency, sightline clearance, access control, and visible patrol presence particularly in hostel clusters, academic corridors such as the ICT, Life Sciences axis, and peripheral residential routes are likely to yield the greatest reduction in fear. By integrating spatial mapping with inferential statistics, the study provides a robust, evidence-based framework for identifying high-risk zones and implementing place-specific interventions that directly address the environmental roots of fear.

Impact of fear on campus life

The embedded design used in this study allows quantitative patterns of fear which is the dominant part to be read alongside campus users' lived experiences (qualitative pattern). This is relevant because fear is not only a statistical outcome but a social and spatial condition shaped by the environment, as emphasised in Environmental Criminology and Defensible Space Theory. When both strands of data are brought together, a clearer picture emerges of how fear affects academic routines, mobility, and social participation across the UNIBEN campus.

Respondent 1:

Q15: "I feel anxious and stressed when I walk around the campus, especially at night." Q16: "I tend to avoid studying in some locations, which affects my preparation for exams." Q17: "I avoid socializing with friends at night because I'm always worried about my safety."

Analysis: This individual expresses a strong emotional reaction (anxiety and stress) linked to the fear of walking

on campus, which also impacts their academic activities (avoiding study locations) and social life (avoiding socializing at night).

Respondent 2:

Q15: "Fear makes me feel helpless and vulnerable, like I'm always on edge." Q16: "I miss important lectures because I'm too afraid to go to some lecture halls." Q17: "I rarely go to social gatherings because I feel unsafe, especially in less populated areas."

Respondent 3:

Q15: "I feel worried and constantly check my surroundings when walking around campus." Q16: "I skip some group study sessions, fearing that something might happen to me on the way." Q17: "I don't attend any events after dark, even though my friends invite me."

Respondent 4:

Q15: "It makes me feel uncomfortable and uneasy to be on campus at night." Q16: "I don't participate in evening classes because I'm always scared to walk back to my hostel afterward." Q17: "I no longer join campus clubs or hang out with my peers during the evenings."

Respondent 5:

Q15: "I feel paranoid, especially when I'm alone in isolated parts of the campus." Q16: "I cannot focus on my academic work, as my mind is always preoccupied with fear." Q17: "I've stopped attending sports events because of fear of being in open spaces at night."

Respondent 6:

Q15: "I feel trapped and like there's no escape from the fear surrounding me." Q16: "I avoid academic discussions in certain parts of the campus where I feel unsafe." Q17: "I no longer engage in campus outings, as the fear of something happening outweighs my desire to socialize."

Respondent 7:

Q15: "It makes me feel uncertain and hesitant about my surroundings." Q16: "I find it hard to concentrate on my assignments when I feel unsafe." Q17: "I've stopped going to the cafeteria late at night because I don't feel safe around that area."

Respondent 8:

Q15: "Fear makes me feel like I'm always on guard, looking for danger." Q16: "I don't participate in group projects because I'm too afraid to be out on the campus late." Q17: "I avoid all social gatherings at night, even though I used to enjoy them."

Respondent 9:

Q15: "I feel a sense of dread when walking alone, especially at night." Q16: "I skip evening lectures because of the fear of walking alone after dark." Q17: "I stopped hanging out with my friends after sunset due to fear."

Respondent 10:

Q15: "Fear makes me feel like I have to rush everywhere, I can't be relaxed." Q16: "I find it difficult to attend evening seminars because of the fear of walking through dark paths to the seminar hall." Q17: "I stopped

attending evening movie nights with friends because of my fear of staying out late."

Respondent 11:

Q15: "I feel uneasy and constantly worried that something bad might happen." Q16: "I avoid doing any night study sessions, even when they're necessary for my exams." Q17: "I rarely hang out with my classmates or attend any events in the evening because of the fear of walking through isolated areas."

Respondent 12:

Q15: "It makes me feel paranoid, always looking over my shoulder." Q16: "I find it difficult to attend evening tutorials because of the long walk back to my hostel afterward." Q17: "I no longer participate in late-night study groups or socializing at the library."

Respondent 13:

Q15: "I feel tense and on edge, especially when I'm walking through less populated areas." Q16: "I often skip important academic meetings and discussions because I'm afraid of walking home late." Q17: "I don't attend social activities with my friends in the evenings anymore, as I'm too scared to stay out after dark."

Respondent 14:

Q15: "I feel restless and can't shake the fear, even during the day." Q16: "I miss some classes because I feel uncomfortable walking through certain parts of the campus." Q17: "I no longer go out for lunch or dinner with friends because I feel unsafe, especially after dark."

Respondent 15:

Q15: "Fear makes me feel distrustful of the surroundings, always expecting something bad." Q16: "I often skip practical classes that are held in isolated areas because I fear walking there alone." Q17: "I don't attend any campus events after sunset, even though I used to enjoy them."

Respondent 16:

Q15: "I feel constantly on high alert and have trouble relaxing on campus." Q16: "I avoid engaging in group study sessions because of the fear of walking alone after." Q17: "I've stopped attending sports practice sessions in the evening due to fear."

Respondent 17:

Q15: "It makes me feel unsafe, like I can't fully enjoy being on campus." Q16: "I find myself not going to the library in the evenings, even though it affects my studies." Q17: "I no longer participate in social meetups or evening social activities with friends."

Respondent 18:

Q15: "I feel trapped and like I can't escape my anxiety." Q16: "I no longer go to evening lectures because I am too scared to walk across campus alone at night." Q17: "I stopped attending parties and social events because I always feel like something might happen."

Respondent 19:

Q15: "It makes me feel uneasy, especially when I am walking past poorly lit areas." Q16: "I avoid attending

seminars or guest lectures that take place in isolated buildings." Q17: "I don't join late-night social outings with friends anymore due to the fear of the dark."

Respondent 20:

Q15: "I feel anxious and uncomfortable whenever I'm on campus after dark." Q16: "I often skip assignments or project meetings that require staying late on campus." Q17: "I no longer attend any late-night social events, even though I miss out on fun moments with friends."

The qualitative narratives complement and extend the quantitative and spatial findings of the study, demonstrating how fear is experienced and enacted across the University of Benin campus. Statistical results showed that fear intensifies at night, while KDE maps identified consistent hotspots around hostel clusters, the Life Sciences axis, the ICT Centre, and isolated pedestrian corridors. Students' descriptions of unease walking past poorly lit hostels, navigating academic blocks after dark, and exercising heightened alertness along secluded paths confirm that these spatial hotspots reflect lived, emotionally charged experiences rather than abstract data points.

These patterns align closely with Newman's defensible space theory (1976), which posits that environments lacking natural surveillance and clear territorial cues increase perceived vulnerability. Narratives of checking over shoulders, rushing through corridors, and avoiding unlit paths correspond to KDE hotspots where defensible-space elements are weak. Environmental criminology offers a complementary perspective, emphasising that fear concentrates where routine activities intersect with inadequate guardianship (Brantingham & Brantingham, 2020). Students' avoidance of night-time academic work and solitary movement underscores this principle, reinforcing the non-random, clustered nature of fear.

The findings also support situational crime prevention insights, highlighting how poor lighting, weak surveillance, and neglected maintenance amplify insecurity (Clarke, 1983; 1997). Students' references to dark walkways and isolated shortcuts illustrate how environmental cues generate fear. Socially, fear reshapes routines and reduces engagement in communal spaces, as described by Pain (2000). Students skipped evening lectures, withdrew from clubs, and avoided late-night study groups, demonstrating that environmental conditions not only provoke fear but also perpetuate behavioural withdrawal.

The integration of qualitative narratives with quantitative and spatial data confirms that fear is spatially, temporally, and socially patterned, shaped by environmental design, surveillance, and social interaction, producing predictable fear-scape zones across campus.

Recommendations

Improving safety on the UNIBEN Ugbowo campus requires a comprehensive, evidence-based strategy addressing both environmental and social dimensions of fear. Spatial analysis identified persistent hotspots around the ICT Centre, hostel clusters, and Faculty of Agriculture, while qualitative narratives revealed that poor lighting, weak surveillance, and physical disorder amplify anxiety. Prioritising strategic lighting upgrades along major pedestrian routes, academic blocks, and hostel surroundings would enhance visibility, reduce concealment opportunities, and reinforce territorial control, reflecting situational crime prevention principles.

Security infrastructure must also be strengthened. Fear intensifies in areas with limited guardianship and unclear surveillance lines. Expanding CCTV coverage, enhancing monitoring reliability, and increasing visible foot and mobile patrols would reinforce defensible space principles and improve psychological comfort, as students reported feeling exposed in isolated corridors. Gender-sensitive measures are crucial, given the heightened fear reported by female students at night. Safe-ride services, trained escort teams, and self-defence programmes would address these vulnerabilities and ensure equitable access to campus spaces.

Social interventions are equally important. Fear disrupts participation and weakens informal guardianship. Peer safety networks, volunteer patrols, hostel watch groups, and safety education programmes can rebuild social cohesion and collective responsibility, shifting the psychological landscape of fear. Academic spaces also require attention; expanding secure study zones and extending library hours with increased monitoring would enable students to engage without anxiety.

Finally, off-campus residents face heightened anxiety along poorly lit routes on campus. Collaboration with local law enforcement, community security structures, and routine safety audits informed by student feedback are essential to ensure interventions remain adaptive. By integrating environmental, social, and infrastructural measures, UNIBEN can systematically reduce fear and strengthen both physical and psychological security across campus.

Empirically, the study produced the spatial fear-scape mapping of a Nigerian university campus, demonstrating how fear clustered, persisted, and varied across functional zones rather than remaining randomly distributed. Methodologically, it integrated Kernel Density Estimation with perceptual survey data, allowing subjective fear experiences to be spatially modelled and analysed with geographic precision. Theoretically, it operationalised fear-scape as a planning-relevant construct, shifting it from an abstract socio-spatial idea to a measurable framework capable of informing campus design, surveillance strategies, and environmental interventions.

Conclusion

This study set out to examine the fear-scape of the University of Benin's Ugbowo Campus by analysing how spatial conditions, demographic characteristics, and institutional structures shape perceptions of fear, security, and safety. Using an embedded mixed-methods design, the study combined quantitative measures of fear with spatial mapping and narrative accounts, providing a comprehensive understanding of how fear is produced, experienced, and patterned across the campus environment.

The study identified associations rather than causation. Fear was interpreted as an environmentally mediated perception shaped by spatial cues and everyday encounters, not as a direct outcome of recorded crime patterns. Consequently, the policy recommendations were precautionary and spatially targeted, designed to reduce exposure to fear-inducing environments rather than to predict or forecast specific criminal events.

The findings show that fear on campus is spatially uneven. Night-time fear was notably more intense than daytime fear. Kernel Density Estimation revealed persistent hotspots around the ICT Centre, Life Sciences cluster, and the hostel corridors, all areas characterised by weak lighting, limited surveillance, and fragmented pedestrian movement. The narratives reinforced these patterns, illustrating how environmental cues such as poor visibility, isolation, and inadequate guardianship translate into anxiety, hyper-vigilance, avoidance behaviours, and reduced participation in academic and social activities. These results align with the propositions of Environmental Criminology, Situational Crime Prevention, and Defensible Space theory, which together explain how poorly structured spaces amplify perceived vulnerability.

The study contributes to campus safety research by offering a contextualised fear-scape model that integrates spatial, social, and psychological dimensions. For UNIBEN, the implications are clear as it focuses on environmental upgrades, gender-sensitive measures, and strengthened surveillance systems which are essential for improving the lived experience of campus users. Addressing these conditions would support academic engagement, enhance social cohesion, and promote a stronger sense of belonging.

As with all case-based research, the findings reflect the specific spatial and institutional context of the Ugbowo Campus and should be interpreted with this scope in mind. Future research could extend this work by comparing Fear-scapes across multiple Nigerian universities or by incorporating longitudinal methods to examine how fear changes as campus environments evolve.

Generally, the study demonstrates that fear is not merely an emotional state but a spatial and institutional

phenomenon with measurable academic and social consequences. Recognising and addressing it is central to building safer, more inclusive university environments.

Nevertheless, several limitations should be acknowledged. The study relies on self-reported perceptions of fear, security, and safety, which may be influenced by individual experiences, recall bias, or momentary emotional states. The cross-sectional design also limits the ability to infer causal relationships or capture how fear perceptions shift over time in response to environmental or institutional changes. In addition, while Kernel Density Estimation effectively identifies fear hotspots, it does not directly measure actual crime incidence, and therefore reflects perceived rather than recorded risk.

Future research could address these limitations by adopting longitudinal designs to track changes in fear across academic sessions, integrating official crime and incident records to compare perceived and actual risk, and extending the analysis to multiple university campuses to enable comparative insights. Further work could also incorporate in-depth interviews or participatory mapping techniques to deepen understanding of how different user groups interpret and negotiate fearful spaces.

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Author contribution

Conceptualization, J.O.E.; methodology, J.O.E.; formal analysis, J.O.E.; investigation, J.O.E.; writing – original draft, J.O.E.; Proof Reading, P.V.O. All authors have read and agreed to the published version of the manuscript.

Informed Consent Statement

The study protocol was reviewed and approved by the Ethics Committee of the University of Benin (UNIBEN). All participants included in this study were clearly informed about the purpose of the research, the nature of the procedures, the duration of participation, and the type of data collected through the questionnaires. Participation was voluntary, and respondents had the right to withdraw at any time without any consequences and without the need to provide a justification.

Informed consent was explicitly obtained from each participant prior to inclusion in the study, by agreeing to the consent form and proceeding with the completion of the questionnaires..

Conflicts of interest

The authors declare no conflict of interest.

References

- Adebamiwa, O. M. (n.d.). Between comfort and crisis: The unequal reality of hostel life in Nigerian universities StraightFromNaija. [Facebook post]. Facebook.
<https://www.facebook.com/straightfromnaija/posts/between-comfort-and-crisis-the-unequal-reality-of-hostel-life-in-nigerian-univer/1448020770666974/>
- Agberagba, J.T. & Amupitan, R.Y. (2024). Student Self-Policing, Safety and Security Consciousness in Nigerian Schools: Crime Prevention Through Environmental Design for University of Jos Plateau State. *Humanus Discourse*, 4(2) 1-19.
https://www.researchgate.net/publication/379427887_Student_Self-Policing_Safety_and_Security_Consciousness_in_Nigerian_Schools_Crime_Prevention_Through_Environmental_Design_for_University_of_Jos_Plateau_State
- Ajadi, O. (2025). Campus Security Measures and Perceived Undergraduate Satisfaction in Obafemi Awolowo University, Ile-Ife, Nigeria. *COMPETITIVE: Journal of Education*, 4(2), 141–158.
<https://doi.org/10.58355/competitive.v4i2.159>
- Akinbowale, O.E., Zerihun, M.F., & Mashigo, P. (2024). Application of Situational Crime Prevention Framework for Cybercrime Mitigation. *International Journal of Cyber Behavior, Psychology and Learning*, (1), <https://doi.org/10.4018/IJCBPL.353436>
- Anyanwu, C., Ipem, J.N., Eluemuno, A.I., & Ogunsola, A.O. (2023). Influence Of Insecurity On Undergraduate Students Examination Taking Behaviour In The Universities Of South-East Geopolitical Zone. *International Journal of Management, Social Sciences, Peace and Conflict Studies (IJMSSPCS)*, 6(2) 99- 107.
https://www.researchgate.net/publication/372104070_INFLUENCE_OF_INSECURITY_ON_UNDERGRADUATE_STUDENTS_EXAMINATION_TAKING_BEHAVIOUR_IN_THE_UNIVERSITIES_OF_SOUTH-EAST_GEOPOLITICAL_ZONE
- Atlas, R. (1990). "Offensible Space" — Law and Order Obstruction through Environmental Design. *Proceedings of the Human Factors Society Annual Meeting*, 34(7), 570-574.
<https://doi.org/10.1177/154193129003400708>
- Auzeen, S., & Rob, T.G. (2019). Resident Students' Perception of Safety in On-Campus Residential Facilities: Does Crime Prevention through Environmental Design (CPTED) Make a Difference?. *Journal of School Violence*, doi: 10.1080/15388220.2019.1617721
- Badiora, A.I. (2017). Pattern of crimes on campuses: A spatial analysis of crimeand concerns of safety at a Nigerian University. *Acta Criminologica: Southern African Journal of Criminology*, 30(3). Special edition: Violence and crime at educational centres.
<https://www.researchgate.net/publication/323546646>

- _Patterns_of_crime_on_campuses_A_spatial_analysis_of_crime_and_concerns_for_safety_at_a_Nigerian_University#:~:text=The%20agency%20since%20its%20establishment,oriented%20teaching%20and%20learning%20environment.&text=Kingsley%20Edinoh%20Phd.
- Barrett, K.L., Jennings, W.G., & Lynch, M.J. (2012). The Relation Between Youth Fear and Avoidance of Crime in School and Academic Experiences. *Journal of School Violence*, 11(1), 1–20. <https://doi.org/10.1080/15388220.2011.630309>
- Berebon, C.B. (2023). Challenges of Insecurity in Nigeria: Impacts on University Education and Governance. *Journal of Research and Innovation*, 1(1) 57-70. doi: <https://doi.org/10.59562> https://www.researchgate.net/publication/387146676_Challenges_of_Insecurity_in_Nigeria_Impacts_on_University_Education_and_Governance_ARTICLE_HISTORY
- Bleicher S.S. (2017). The landscape of fear conceptual framework: definition and review of current applications and misuses. *PeerJ Preprints*, 5:e2840v4 <https://doi.org/10.7287/peerj.preprints.2840v4>
- Blöbaum, A., & Hunecke, M. (2005). Perceived Danger in Urban Public Space: The Impacts of Physical Features and Personal Factors. *Environment and Behavior*, 37(4), 465-486. <https://doi.org/10.1177/0013916504269643>
- Brantingham, P.J., & Brantingham, P.L. (1981). Environmental criminology. Beverly Hills, CA: Sage Publications. <https://www.scirp.org/reference/referencespapers?referenceid=1225990>
- Brantingham, P., & Brantingham, P. (2021). Crime Pattern Theory. Oxford Research Encyclopedia of Criminology. <https://oxfordre.com/criminology/view/10.1093/acrefore/9780190264079.001.0001/acrefore-9780190264079-e-8> (accessed on 05.11.2025)
- Brantingham, P.J., Brantingham, P.L., Song, J., & Spicer, V. (2020). Crime Hot Spots, Crime Corridors and the Journey to Crime: An Expanded Theoretical Model of the Generation of Crime Concentrations. In: Lersch, K., Chakraborty, J. (eds) *Geographies of Behavioural Health, Crime, and Disorder. GeoJournal Library*, vol 126. Springer, Cham. https://doi.org/10.1007/978-3-030-33467-3_4
- Carrico, B.A. (2016). The Effects of Students' Perceptions of Campus Safety and Security on Student Enrollment. *Theses, Dissertations and Capstones*. Paper 1006. <https://files.core.ac.uk/download/pdf/232728551.pdf>
- Clarke R.V. (1983). Situational crime prevention: its theoretical basis and practical scope. *Crime Justice*, 4, 225–256. doi:10.1086/449090. <https://www.journals.uchicago.edu/doi/10.1086/44909>
- Clarke R.V. (1997). Situational Crime Prevention: Successful Case Studies. Available online at http://www.popcenter.org/library/reading/pdfs/scp2_intro.pdf.
- Cohen, L. E., & Felson, M. (1979). Social change and crime rate trends: A routine activity approach. *American Sociological Review*, 44(4), 588–608. <http://dx.doi.org/10.2307/2094589>
- Coleman, A.M. (1985). Utopia on trial: Vision and reality in planned housing. London: Hilary Shipman.
- Cornish, D., & Clarke, R.V. (1986). The Reasoning Criminal: Rational Choice Perspectives on Offending. Hague: Springer-Verlag. <https://www.scirp.org/reference/referencespapers?referenceid=1226005>
- Cozens, P., & Linde, T. (2015). Perceptions of Crime Prevention Through Environmental Design (CPTED) at Australian Railway Stations. *Journal of Public Transportation*, 18 (4) 73-92. <https://doi.org/10.5038/2375-0901.18.4.5>
- Cozens, P., & Sun, M.Y. (2019). Exploring crime prevention through environmental design (CPTED) and students' fear of crime at an Australian university campus using prospect and refuge theory. *Property Management*, 37 (2), 287–306. <https://doi.org/10.1108/PM-04-2018-0023>
- Curtis, J.W. (2012). Integrating Sketch Maps with GIS to Explore Fear of Crime in the Urban Environment: A Review of the Past and Prospects for the Future. *Cartography and Geographic Information Science*, 39(4), 175–186. <https://doi.org/10.1559/15230406394175>
- Curtis-Ham, S., Bernasco, W., Medvedev, O.N., & Polaschek, D.L.L. (2023). Relationships Between Offenders' Crime Locations and Different Prior Activity Locations as Recorded in Police Data. *J Police Crim Psych*, 38, 172–185. <https://doi.org/10.1007/s11896-022-09540-8>
- Day, K. (2001). Constructing Masculinity and Women's Fear in Public Space in Irvine, California. *Gender, Place & Culture*, 8(2), 109–127. <https://doi.org/10.1080/09663690120050742>
- Eklblom, P. (1997). Gearing up against crime: A dynamic framework to help designers keep up with the adaptive criminal in a changing world. *International Journal of Risk, Security and Crime Prevention*, 2(4), 249–265.
- Ekpoh, U.I., Edet, A.O., & Ukpong, N.N. (2020). Security Challenges in Universities: Implications for Safe School Environment. *Journal of Educational and Social Research*, 10(6), 112. <https://doi.org/10.36941/jesr-2020-0113>
- Evans, D., Coole, M., & Brooks, D.J. (2024). Toward biodefence: a framework for the mitigation of malicious threats to livestock production enterprises in Australia. *Eur. Phys. J. Plus*, 139, 573. <https://doi.org/10.1140/epjp/s13360-024-05383-w>
- Farrington, D.P., & Welsh, B.C. (2007). Improved street lighting and crime prevention: A systematic review. National Council for Crime Prevention

- Fennelly, L.J., & Perry, M.A. (2018). CPTED and Traditional Security Countermeasures. 150 Things You Should Know. 1st Edition, CRC Press. <https://www.taylorfrancis.com/chapters/edit/10.4324/9781315144528-2/defensible-space-theory-cpted-lawrence-fennelly-marianna-perry>
- Fernandez, M.F. (2005). Crime prevention and the perception of safety in campus design. LSU Master's Theses. 1483. https://repository.lsu.edu/gradschool_theses/1483
- Fisher, B.S., & May, D. (2009). College Students' Crime-Related Fears on Campus: Are Fear-Provoking Cues Gendered? Are Fear-Provoking Cues Gendered?. *Journal of Contemporary Criminal Justice*, 25(3), 300-321. <https://doi.org/10.1177/1043986209335013>
- Fisher, B., Anthony, D.L., & Perkins, D.D. (2013). Defensible space theory. In J.I. Ross (Ed.), *Encyclopedia of Street Crime in America* (pp. 130-133). Sage Publications. (March 28, 2013) ISBN-10: 141299957X ISBN-13: 978-1412999571 https://www.researchgate.net/publication/338146705_Defensible_space_theory
- GCPEA (Global Coalition to Protect Education from Attack). (2024). Education under attack: Nigeria country profile 2024. New York, NY: GCPEA. <https://www.norrageducation.org/gcpea-education-under-attack-2024-report/>
- Gold, J.R. (2003). Exploring landscapes of fear: marginality, spectacle and surveillance. *Capital & Class*. <https://doi.org/10.1177/030981680308000104>
- Huang, D., Ceccato, V., & Kytä, M. (2022). Safety perceptions in university campuses: The role of environment. *Crime Prevention and Community Safety*, 24(3), 266-285. <https://doi.org/10.1057/s41300-022-00148-y>
- Ilori, S.O., Ilori, A.A., & Alaba, E.V. (2024). Campus Criminality and Vulnerability of Victimisation among Undergraduate Students in Ekiti State Urban Universities. *International Journal of Research and Innovation in Social Science (IJRISS)*, 8(07), 2602-2612. <https://doi.org/https://dx.doi.org/10.47772/IJRISS.2024.807202>
- Jakobi, Á., & Pődör, A. (2020). GIS-Based Statistical Analysis of Detecting Fear of Crime with Digital Sketch Maps: A Hungarian Multicity Study. *ISPRS International Journal of Geo-Information*, 9(4), 229. <https://doi.org/10.3390/ijgi9040229>
- Lane, J. (2015). Fear of Crime. In J.D. Wright (Ed.), *International Encyclopedia of the Social & Behavioral Sciences (Second Edition)*. Elsevier, 854-859. <https://doi.org/10.1016/B978-0-08-097086-8.45058-0>
- Lee, J.S., Park, S., & Jung, S. (2016). Effect of Crime Prevention through Environmental Design (CPTED) Measures on Active Living and Fear of Crime. *Sustainability*, 8(9), 872. <https://doi.org/10.3390/su8090872>
- Liu, L., Li, C., Xiao, L., & Song, G. (2024). Explaining Theft Using Offenders' Activity Space Inferred from Residents' Mobile Phone Data. *ISPRS International Journal of Geo-Information*, 13(1), 8. <https://doi.org/10.3390/ijgi13010008>
- Lorenc, T., Clayton, S., Neary, D., Whitehead, M., Petticrew, M., Thomson, H., Cummins, S., Sowden, A., & Renton, A. (2012). Crime, fear of crime, environment, and mental health and wellbeing: Mapping review of theories and causal pathways. *Health & Place*, 18(4) 757-765. <https://doi.org/10.1016/j.healthplace.2012.04.001>
- Lorenc, T., Petticrew, M., Whitehead M., Neary, D., Clayton, S., Wright, K., Thomson, H., Cummins, S., Sowden, A., & Renton, A. (2014). Crime, fear of crime and mental health: synthesis of theory and systematic reviews of interventions and qualitative evidence. Southampton (UK): NIHR Journals Library; 2014 Mar. (Public Health Research, No. 2.2.) Chapter 3, Review of theories and pathways: findings. <https://www.ncbi.nlm.nih.gov/books/NBK262852/>
- Maier, S.L., & DePrince, B.T. (2019). College Students' Fear of Crime and Perception of Safety: The Influence of Personal and University Prevention Measures. *Journal of Criminal Justice Education*, 31(1), 63-81. <https://doi.org/10.1080/10511253.2019.1656757>
- Mayowa, I.O., Matanmi, K.A., Awojori, A.J., & Fasuan, E.O. (2021). The fear of crime and public safety in urban Nigeria: Implications for policy options. <https://www.researchgate.net/publication/348618171>
- Mehta, V. (2013). Evaluating Public Space. *Journal of Urban Design*, 19(1), 53-88. <https://doi.org/10.1080/13574809.2013.854698>
- Mkhize, S., Cinini, S.F., & Ngcece, S. (2022). University campuses and types of crime: A case study of the university of KwaZulu-Natal/Howard campus in the city of Durban-South Africa. *Cogent Social Sciences*, 8(1). <https://doi.org/10.1080/23311886.2022.2110199>
- Moral, B. & Gafar, M. (2021). An Exploration of Crime Prevention Through Environmental Design (Cpted) Principles For Enhancing Safety And Security In The design Of Adamawa State University Students' Hostel, Mubi. *Architecture and Planning Journal (APJ)*, 27(2), 5. <https://digitalcommons.bau.edu.lb/apj/vol27/iss2/5>
- Newman, O. (1976). Design guidelines for creating defensible space (NIJ Report No. 148313). U.S. Department of Justice. <https://www.ojp.gov/pdffiles1/Digitization/148313NCJRS.pdf>
- Ogunode, N.J., Uzokor, C.U., & Ayuko, V.O. (2023). Insecurity Challenges and Higher Education in Nigeria. *Best Journal of Innovation In science, Research And Development*, 2(5) 61-78. https://www.researchgate.net/publication/370731231_Insecurity_Challenges_and_Higher_Education_in_

- Administration; Savannah*, 23(1), 1-20. [https://www.proquest.com/openview/09d5ee09d3e080f805c4738957af43b6/1?pq-origsite=gscholar&cbl=48159#:~:text=Sloan%20et%20al.%20\(1995b\)%20and%20Fisher%20et%20most%20of%20their%20time%20on%20the%20campus](https://www.proquest.com/openview/09d5ee09d3e080f805c4738957af43b6/1?pq-origsite=gscholar&cbl=48159#:~:text=Sloan%20et%20al.%20(1995b)%20and%20Fisher%20et%20most%20of%20their%20time%20on%20the%20campus)
- Snider, K.M. (2023). How Perceptions of Safety and Anxiety Affect Campus Carry. *Graduate Student Theses, Dissertations, & Professional Papers*, 12224. <https://scholarworks.umt.edu/etd/12224>
- Tarus, S. (2025). Fear of Crime Among Campus Students: An Analysis of Residential Settings and Demographic Predictors in Kenya. *International Journal of Research and Innovation in Social Science (IJRISS)*, 9(07), 4720-4740. <https://doi.org/https://dx.doi.org/10.47772/IJRISS.2025.907000382>
- Taylor, R.B., Gottfredson, S.D. & Brower, S. (1984) Block Crime and Fear: Defensible Space, Local Social Ties, and Territorial Functioning. *Journal of Research in Crime and Delinquency*, 21, 303-331. <http://dx.doi.org/10.1177/0022427884021004003>
- Traffic Management Products Ltd. (n.d.). School zone safety: Creating safer environments for children, staff, and visitors. TMP. <https://tmp.solutions/school-zone-safety/>
- Trogisch, L. (2022). Navigating fearscape: women's coping strategies with(in) the conservation-conflict nexus in the Eastern Democratic Republic of the Congo. *Gender, Place & Culture*, 30(3), 350-373. <https://doi.org/10.1080/0966369X.2022.2035695>
- Tulumello, S. (2015). Fear and Urban Planning in Ordinary Cities: From Theory to Practice. *Planning Practice & Research*, 30(5), 477-496. <https://doi.org/10.1080/02697459.2015.1025677>
- Tulumello, S. (2017). Living in a Fearscape?. In: *Fear, Space and Urban Planning. UNIPA Springer Series*. Springer, Cham. https://doi.org/10.1007/978-3-319-43937-2_1
- Tulumello, S. (2024). Geographies of Fear. In: B. Warf (Eds.) *The Encyclopedia of Human Geography*. Springer, Cham. https://doi.org/10.1007/978-3-031-25900-5_229-1
- Tykesson, M. (2025). Effects of CCTV on Fear of Crime: a Systematic Literature Review. *Eur J Crim Policy Res*. <https://doi.org/10.1007/s10610-025-09633-0>
- Uduo, T.A. (2025). Understanding Environmental Criminology: Theory, Practice, and Implications for Lagos State Residents in Nigeria. *Eastern African Journal of Humanities and Social Sciences*, 4(1), 49-58. DOI: <https://doi.org/10.58721/eajhss.v4i1.860>
- University of Benin (2022). Student information handbook (Student Affairs Division). University of Benin. <http://uniben.edu/STUDENTHANDBOOK.pdf>
- Valentine, G. (1989). The geography of women's fear. *Area*, 21(4), 385-390
- Weisburd, D., White, C., Wire, S., & Wilson, D.B. (2021). Enhancing Informal Social Controls to Reduce Crime: Evidence from a Study of Crime Hot Spots. *Prev. Sci.*, 22, 509-522. <https://doi.org/10.1007/s11121-020-01194-4>
- Wilk, L., & Fibinger, B. (2020). Social Fear of Crime and Its Consequences. *Scientific Journal of Bielsko-Biala School of Finance and Law. Bielsko-Biala*, 24(1), 54-58. <https://doi.org/10.5604/01.3001.0014.1353>
- Yang, S., Nakajima, H., Yang, Y., Shin, Y., & Koizumi, H. (2024). The impact of surveillance cameras and community safety activities on crime prevention: Evidence from Kakogawa City, Japan. *Sustainable Cities and Society*, 115, 105858. <https://doi.org/10.1016/j.scs.2024.105858>
- Zeng, X., Zhang, B., Chen, S., Lin, Y., & Haans, A. (2025). Exploring the Impact of Daytime and Nighttime Campus Lighting on Emotional Responses and Perceived Restorativeness. *Buildings*, 15(6), 872. <https://doi.org/10.3390/buildings15060872>