Assessment of Lighting Levels in Indoor Pools

Jia (Allison) Pan and Dr. Chun-Yip Hon

jia.h.pan@torontomu.ca

Toronto Metropolitan University

School of Occupational and Public Health

Background

- Studies of lighting in public spaces, particularly street and roadway lighting, have shown improvements in safety and comfort. However, little research exists on lighting in public swimming pools (Peña-García et al., 2015; Trop et al., 2023).
- A study found that lighting plays a significant role in swimming pools, impacting users' health, safety, and overall satisfaction (Lau et al., 2021).
- The Ontario Building Code (O. Reg. 332/12) mandates a minimum lighting level of 200 lux for both pool deck and non-pool deck areas in indoor public pools. However, there is a lack of research assessing lighting levels in Ontario's pools to this requirement.

Objectives

- Explore the perceptions and feelings of pool staff and visitors regarding the lighting environment using structured questionnaires.
- Quantify the daytime and nighttime lighting levels (in lux) at various indoor pools within the local municipality, and compare them to building code requirements.

Methods

Pool Visitors' Perceptions of Lighting

- A survey was administered to pool staff and visitors across 6 pools via convenient sampling.
- Participants were asked to rate their perception of lighting using a Likert scale for the following areas:

1. Pool area during daytime
2. Pool area during night-time
3. Shower area
4. Dressing room
5. Passageway
6. Main pool area

Quantifying Lighting Levels

- Lighting levels (in lux) were measured on-site during both daytime and nighttime using a digital lux meter.
- The lux meter was held horizontally, 1 meter above the ground at the researcher's chest level (Canada, 2023).
- Measurements were taken approximately every 2 meters at each pool, covering both the pool deck and non-pool deck areas (Canada, 2023).
- Measurements were recorded on each pool's floor plan.

Results

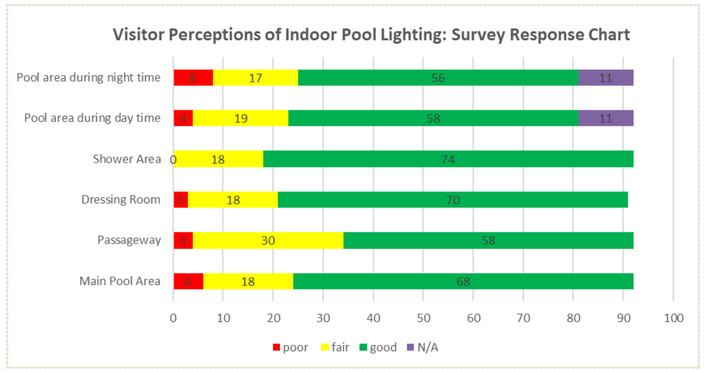

Figure 1.

- Overall, Figure 1 shows that the majority of respondents (33 pool staff, 59 visitors), perceived the indoor pool lighting to be good in different areas, particularly in the shower area.
- However, in the passageway, main pool area, and the pool area during daytime and night-time, a notable portion of respondents rated the lighting as fair or even poor.

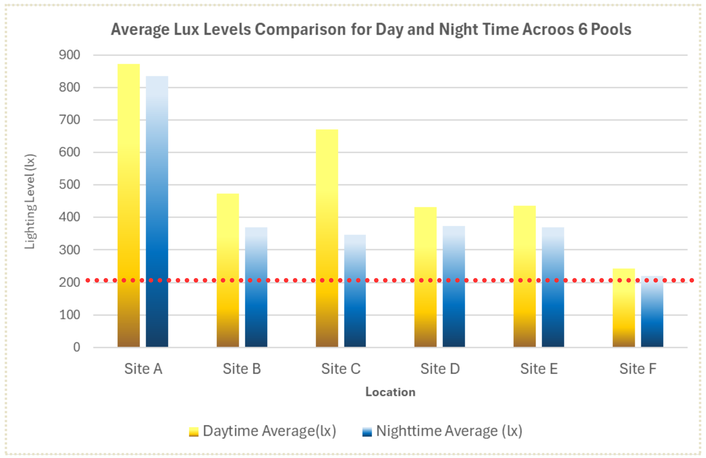

Figure 2.

- Lighting levels were better during the day compared to nighttime across all sites.
- Decrease in lighting between day and night varied; with Site C having the largest decrease (48.28%).
- Site F had the lowest average lighting levels (day: 242.6 lux, night: 219.09 lux) among all sites which barely exceeded the 200 lux threshold.

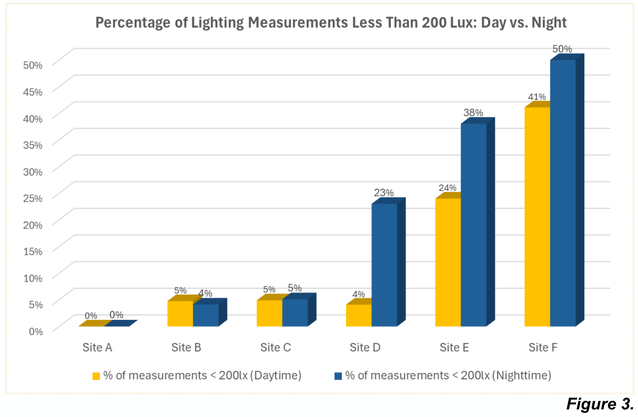

Figure 3.

- Percentage of lighting measurements less than 200 lux varied across all sites, with poorer compliance during nighttime compared to daytime.
- Site D had the greatest disparity in compliance between day and night, non-compliant measurements increasing from 4% during the day to 23% at night.
- Site F had the highest percentage of non-compliant measurements; with 50% below the threshold at night.

Conclusion

- Survey showed discrepancies in visitor perception of lighting, especially in passageways and pool areas, with many ratings falling in the fair to poor range.
- Site E and F had the highest non-compliance percentages during day and night, aligning with reported poor lighting by respondents.
- Site F failed to meet Ontario Building Code requirements, highlighting the urgent need for lighting improvement.
- Despite average lighting levels above 200 lux across all sites, both survey results and measurement data indicate the need for lighting improvements to ensure safety and satisfaction.

References

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