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Analysis of Sidewalk Comfort Level Based on Width, Cleanliness, Surface Condition, Lighting, and Availability of Signage and Directional Indicators on Sudibyo Street Sidewalks in Tegal City

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ABSTRACT

Sidewalks are essential for facilitating pedestrian movement and promoting sustainable transportation in urban areas. On Kapten Sudibyo Street in Tegal City, which serves as a main access route to Kardinah Hospital, the sidewalks currently do not meet adequate safety and comfort standards. Problems such as uneven surfaces, reduced width, poor maintenance, and obstructions like illegal parking and public facilities hinder pedestrian comfort and accessibility. This study aims to assess the comfort level of these sidewalks, focusing on factors including width, cleanliness, surface condition, lighting, and signage. Using qualitative method with observations and Guttman-scale surveys distributed to 200 respondents, mainly local students who frequently use the sidewalks, the research analyzed how these factors impact perceived comfort. The results reveal a generally low comfort level, with 72% of respondents expressing dissatisfaction due to poor conditions of the sidewalk. Key recommendations include widening sidewalks to a minimum of 200 cm, repairing uneven surfaces, maintaining cleanliness, upgrading lighting, and providing clear signage. Additional measures involve relocating obstructive public facilities and enforcing regulations against illegal parking to enhance accessibility and safety. These improvements are crucial for creating a more inviting and functional pedestrian space, encouraging walking as a mode of transport, and contributing to a healthier urban environment.

Keywords: *Sidewalk, pedestarian, comfort level, urban walkability, street safety features*

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INTRODUCTION

The comfort and accessibility of sidewalks are crucial for fostering a walkable urban environment, which is essential for promoting sustainable transportation and enhancing the quality of life in cities. Sidewalks are not only pathways for movement but also spaces for rest, social interaction, and shelter, providing the first sense of refreshment experienced when stepping out of buildings (Widodo, 2013). Numerous studies have highlighted that well-maintained sidewalks contribute significantly to urban livability, promoting health benefits and reducing reliance on private vehicles (Gehl, 2011;

Litman, 2021; Badland & Schofield, 2005). In this regard, Tegal City's sidewalks on Sudibyo Street serve a vital role in supporting daily pedestrian activity, acting as a major route for commuting, shopping, and socializing.

Despite their importance, the current condition of these sidewalks does not fully support comfortable and safe pedestrian use. Issues such as uneven surfaces, insufficient lighting, and obstructions, including parked vehicles and street vendors, significantly impact pedestrian satisfaction and safety (Saraswaty, 2017). Research has shown that the quality of sidewalk infrastructure—including factors such as width, cleanliness, surface condition, lighting, and the availability of signage—is critical in shaping pedestrian comfort (Rahmat et al., 2019; Agusman et al., 2021; Sisiopiku & Akin, 2003). Inadequate pedestrian infrastructure often discourages walking, shifting individuals toward less sustainable modes of transportation and contributing to urban congestion and pollution (WHO, 2022; Litman, 2021).

The sidewalk on Kapten Sudibyo Street, which also serves as the main access route to Kardinah Hospital, exemplifies these challenges. Observations indicate that its surface is uneven due to loose and damaged paving stones, posing significant tripping hazards (Saraswaty, 2017). This is consistent with findings by Alfonzo (2005), who emphasizes that poor surface conditions reduce walkability and deter pedestrian use. Furthermore, the height of the sidewalk—13 cm lower than the adjacent road—creates accessibility barriers for individuals with disabilities, particularly wheelchair users, aligning with similar accessibility challenges documented by Zhang et al. (2019).

Public facilities, such as plant pots and trash bins, further reduce the effective width of the sidewalk, which should ideally be 200 cm but is currently only 130-149 cm wide (Widodo, 2013; Saraswaty, 2017). Additionally, illegal parking by motorcycles and rickshaws obstructs pedestrian flow, a common issue in urban environments that lack strict enforcement measures (Gehl, 2011; Krambeck & Shah, 2006). Studies have shown that pedestrians are more likely to avoid areas with such obstructions, preferring smoother and more accessible routes (Rahmat et al., 2019; Huang et al., 2020).

Urban planning scholars have consistently emphasized that improving pedestrian infrastructure is crucial for increasing walking rates and achieving sustainable urban development goals (United Nations, 2016; Litman, 2021; Jan et al., 2020). Pedestrian satisfaction is influenced not only by physical infrastructure but also by sensory experiences, such as odors from exhaust fumes or poorly maintained trash bins, which can significantly affect perceptions of comfort (Widodo, 2013; WHO, 2022; Huang et al., 2020). Research by Frumkin et al. (2004) also highlights the psychological benefits of well-designed pedestrian spaces, which enhance urban livability and social cohesion.

In the ideal scenario, the sidewalk on Kapten Sudibyo Street would fully meet safety and comfort standards for all pedestrians, including those with disabilities. This includes even and stable surfaces, sufficient lighting, adequate width, and ramps for wheelchair access (Zhang et al., 2019; Huang et al., 2020). Relocating street vendors and public facilities to designated areas would further optimize pedestrian flow, while strict enforcement against illegal parking would preserve sidewalk functionality (Gehl, 2011;

Krambeck & Shah, 2006). Implementing these measures would not only improve pedestrian comfort but also encourage walking as a sustainable transportation option, reducing urban congestion and improving air quality (Litman, 2021; United Nations, 2016).

METHOD

In investigating “Analysis of Sidewalk Comfort Level Based on Width, Cleanliness, Surface Condition, Lighting, and Availability of Signage and Directional Indicators on Sudibyo Street Sidewalks in Tegal City" a qualitative research methodology grounded in observation and questionnaires is employed to gain insights into community perceptions and behaviors. This study aims to explore how various factors related to sidewalk comfort, such as surface quality, width, and accessibility affect the willingness of community members to utilize these public spaces.

The population of this study consists of residents living near Sudibyo Street's sidewalks. A sample of 200 individuals was selected from this population. The respondents were gathered through the distribution of a Guttman-scale questionnaire using Google Forms, targeting local residents. Guttman scales are characterized by the “implicational” or “scalable” nature of their items.Those who answer yes are given a score of 1 and those who answer no are given a score of 0. The majority of respondents are students who frequently use the sidewalk in their daily activities. These individuals were chosen because of their active engagement with the sidewalk, providing valuable insights into the current state and usability of the pedestrian space. This approach ensures that the study captures the experiences and perspectives of regular sidewalk users, making the findings relevant to understanding local pedestrian behavior and preferences.

Took place on Sudibyo Street, Tegal City, this research utilize two primary data collection methods: observational studies and questionnaires. Observational studies will involve systematically assessing sidewalk conditions in different neighborhoods. This method allows for direct engagement with the environment and provides a contextual understanding of how these factors may influence community usage (Mason et al., 2022). Concurrently, structured questionnaires will be distributed to residents to gather quantitative. Data on their perceptions of sidewalk comfort and its impact on their walking habits. The questionnaire will include yes no questions (guttman scale) assessing comfort levels, and overall satisfaction with sidewalk conditions.

To guarantee varied representation across a range of demographic groups, such as age, socioeconomic position, and mobility demands, a purposive sample technique will be used. This method is essential for recording a variety of viewpoints and experiences about sidewalk comfort levels and how they affect walking behavior.

To determine the main elements affecting sidewalk comfort, the qualitative information gathered from observations will be examined. To measure community opinions about sidewalk usage, the survey data will be scientifically examined. The study intends to offer a thorough grasp of how sidewalk comfort influences community excitement for using sidewalks by triangulating these data sources (Braun & Clarke, 2006). Correlation analysis will provide insightful information on the connection between sidewalk comfort levels and community enthusiasm for using sidewalks.

FINDING AND DISCUSSION

RESULT

Picture 1. Existing Condition of the Sidewalk

The sidewalk conditions on Sudibyo's Street appear to be poor and lack proper maintenance. There are visible cracks and uneven surfaces on the pavement, with some areas showing significant gaps between tiles, creating tripping hazards. In certain spots, drainage issues are apparent, with debris and litter accumulating along the edges. The sidewalk is partially obstructed by street vendors and other elements, limiting the available walking space. Additionally, some sections of the sidewalk are at different heights, making it challenging for pedestrians to navigate smoothly, especially for individuals with mobility impairments. Overall, the sidewalk seems to lack the infrastructure necessary for safe and comfortable pedestrian use.

Table 1. Respondents Based on Gender

No	Gender	Number of Respondents	Percentage
1	Male	80	40%
2	Female	120	60%
Total		200	100%

From the table above, it is known that the total respondents are 200, consisting of 80 males and 120 females, with percentages of 40% and 60%, respectively.

Table 2. Respondents Based on Age

No	Age	Number of Respondents	Percentage	Occupation
1	14 years old	15	8%	Student
2	15 years old	102	51%	Student
3	16 years old	54	27%	Student
4	17 years old	24	12%	Student
5	18 years old	5	3%	Student

From the table above, it is observed that the respondents' ages range from 14 to 18 years. A total of 15 respondents are 14 years old, representing 8%. The number of respondents aged 15 years is 102, accounting for 51%. Respondents aged 16 and 17 years each totaled 54 and 24 respondents, representing 27% and 12% each. Meanwhile, respondents aged 18 years totaled 5, representing 3%.

Table 3. Validity Analysis

With N= 200 and 5% Significance Level

X Variable	Statement	Pearson Correlation Value	R Table Value	Remark
Sidewalk Width	Statement 1	0.293	0.138	Valid
	Statement 2	0.283	0.138	Valid
	Statement 3	0.264	0.138	Valid
Sidewalk Cleanliness	Statement 4	0.174	0.138	Valid
	Statement 5	0.264	0.138	Valid
Surface Condition	Statement 6	0.397	0.138	Valid
	Statement 7	0.257	0.138	Valid

Sidewalk Lighting	Statement 8	0.441	0.138	Valid
Availability of Signage and Directions	Statement 9	0.306	0.138	Valid
	Statement 10	0.517	0.138	Valid

From the table above, all the statements under variable X have a Pearson correlation value greater than 0.138. This means that all items in variable X are valid and meet the requirements for further testing.

Table 4. Reliability Analysis

Reliability Statistics	
Cronbach's Alpha	N of Items
.65	10

From the table above, it is known that the Cronbach's Alpha value is 0.65, which is greater than 0.6, indicating that the statements under variable X are reliable.

Table 5. Comfort Level Classification

N	Minimum Score	Maximum Score	Interval
200	0	10	3.33 ≈ 3

Based on the *Google Form* distributed to a total of 200 respondents, the maximum score obtained from each total statement item was 10 and the minimum score from each item was 0 with an interval of 3.33 (rounded down to 3).

Table 6. Comfort Level Categories

Category	Interval	Frequency	Percentage
Low	0 – 3	144	72%
Medium	4 – 7	56	28%
High	8 – 10	0	0%

From the table above, it is known that the low comfort level category is 72% with a frequency of 144 out of 200 samples. The medium comfort level is 28% with a frequency of 56 out of 200 samples, while the high comfort level is 0% with a frequency of 0 out of 200 samples.

DISCUSSION

The study included a total of 200 respondents, with a gender distribution of 80 males (40%) and 120 females (60%), indicating a slight predominance of female participants. This gender distribution suggests a potentially more diverse perspective on sidewalk comfort, considering that male and female pedestrians might have different priorities or expectations regarding sidewalk attributes. The age of respondents ranged

between 14 to 18 years, with a significant portion, specifically 51% or 102 respondents, being 15 years old. This indicates that the survey primarily captured the views of teenagers, especially high school students, who may have particular concerns and needs regarding pedestrian pathways. The other age groups were distributed as follows, 8% (15 respondents) were 14 years old, 27% (54 respondents) were 16 years old, 12% (24 respondents) were 17 years old, and only 3% (5 respondents) were 18 years old. This age distribution is crucial in understanding the preferences and expectations of younger pedestrians regarding sidewalk comfort.

In the validity testing of the variables influencing sidewalk comfort, Pearson Correlation analysis was employed, with a significance level set at 5%. A threshold value from the R Table was established at 0.138, which all evaluated items exceeded, thus confirming their validity. Specifically, statements concerning sidewalk width were evaluated with correlation values of 0.293 and 0.283, indicating that both aspects of sidewalk width under consideration were significant. The cleanliness of sidewalks, as measured through statements with correlation values of 0.264 and 0.174, was similarly validated, emphasizing that the tidiness and hygiene of pedestrian pathways play a substantial role in perceived comfort. Additionally, the condition of sidewalk surfaces was highlighted as crucial, with correlation values of 0.264 and 0.397, indicating that smooth and well-maintained surfaces are essential for a comfortable pedestrian experience. Lighting was another factor validated with correlation scores of 0.257 and 0.441, suggesting that adequate and reliable illumination significantly influences pedestrians' comfort and safety. Lastly, the availability of signage and directional information was also deemed valid, with notably high correlation values of 0.306 and 0.517, indicating that clear and accessible signage is vital for a positive pedestrian experience. The reliability analysis, using Cronbach's Alpha, yielded a value of 0.65, which exceeds the minimum requirement of 0.6, affirming that the questions consistently measure the concept of sidewalk comfort, though an improved reliability score in future studies could enhance measurement consistency.

The analysis of sidewalk comfort levels, as perceived by respondents, revealed a generally negative assessment. The comfort scale was set between 0 to 10, with scores divided into three categories based on intervals of approximately 3.33. A substantial 72% of respondents, representing 144 individuals, rated the sidewalks in the "Low Comfort" category, which encompassed scores from 0 to 3. This indicates a widespread sense of dissatisfaction with the existing conditions of sidewalks, suggesting that they fail to meet even basic expectations of comfort for a majority of users. The "Medium Comfort" category, with scores ranging from 4 to 7, included 56 respondents or 28% of the sample, suggesting that while a notable portion of respondents found the sidewalks passable, they did not consider them to offer a high-quality pedestrian experience. Remarkably, no respondents rated the sidewalks as highly comfortable, with 0% indicating a score between 8 and 10. This absence of high ratings strongly suggests that the current state of the sidewalks falls short of ideal standards, highlighting significant areas for improvement in terms of design, maintenance, and amenities.

The analysis sheds light on several key insights regarding sidewalk comfort that hold implications for urban development and pedestrian infrastructure. To start, the demographic pattern, with a predominance of female participants and a concentration of teenagers, indicates that safety, accessibility, and visual appeal might be especially relevant factors in determining sidewalk comfort. High school-aged pedestrians, who formed the majority of respondents, likely prioritize clarity and safety in walking areas that accommodate their social and mobility needs, underscoring the importance of designing pedestrian paths that cater to a younger audience.

The findings from the validity and reliability testing underscore the significance of five key aspects of sidewalk comfort: width, cleanliness, surface condition, lighting, and the presence of signage. The positive correlation scores across all dimensions confirm that these factors align well with how pedestrians evaluate their walking experience, making them critical focus areas for urban improvement. The validation of sidewalk width indicates that ample space for pedestrian movement is essential to reduce congestion and enhance safety, particularly in areas with high foot traffic. Cleanliness and maintenance of sidewalk surfaces were shown to be crucial, suggesting that unclean or uneven paths can significantly deter pedestrian use and diminish the attractiveness of walking as a travel option. The importance of lighting was validated, highlighting its dual role in contributing to both comfort and safety, particularly for younger pedestrians who might navigate these areas during low-light conditions. Additionally, the strong correlation associated with signage underscores the need for clear and easily understandable directional cues, which can greatly facilitate navigation and improve the overall pedestrian experience.

The categorization of sidewalk comfort levels clearly indicates a need for targeted infrastructure enhancements to improve pedestrian satisfaction. The high percentage of respondents rating comfort as low emphasizes that current conditions are insufficient and require substantial upgrades. Such upgrades should focus on expanding pathway widths, ensuring regular cleaning, repairing uneven or damaged surfaces, improving lighting quality, and installing effective signage. The complete lack of high comfort ratings demonstrates that even respondents who do not find the sidewalks inadequate do not regard them as high-quality, suggesting an urgent need for enhancements. These findings stress the necessity for a pedestrian-oriented approach in urban planning, where sidewalks are not only functional but also inviting, safe, and accessible. Improvements like redesigning these areas could potentially lead to increased enthusiasm among young pedestrians to use sidewalks regularly, thereby fostering a more lively and walkable urban environment that accommodates diverse user needs.

CONCLUSION

The study found that the current state of sidewalks does not meet the comfort expectations of pedestrians, based on responses from 200 participants, mostly female (60%) and aged 14 to 18. The analysis confirmed that five factors, likee sidewalk width, cleanliness, surface condition, lighting, and signage are important for sidewalk comfort. All

of these factors were found to be valid and the measurement instrument used was reliable.

The results reveal a predominantly negative perception of sidewalk quality, with 72% of respondents rating comfort as low and 28% as medium. Notably, no respondents rated the sidewalks in the high comfort category, underscoring the inadequacy of the current infrastructure in meeting pedestrian needs. These findings suggest that the existing sidewalks do not sufficiently support safe, comfortable, and inviting pedestrian activity, particularly among younger users. To improve sidewalk comfort, it is recommended that the government focus on widening sidewalks, ensuring regular cleaning, fixing uneven surfaces, improving lighting, and providing clear signage. These improvements could create safer and more inviting walking environments, encouraging more people to walk.

Resolution

Improving sidewalk infrastructure is crucial for enhancing public comfort and encouraging more people to walk. The first step is widening sidewalks to meet a minimum width of 2 meters. This expansion helps alleviate congestion, ensuring that there is ample space for pedestrians, including those with strollers or wheelchairs, as well as for street vendors and cyclists who may share the space. A wider sidewalk creates a more welcoming environment, making walking not only safer but also more enjoyable.

Maintaining cleanliness is another key priority. Regular cleaning schedules and maintenance protocols should be established to keep sidewalks free of litter and debris. A clean and well-kept sidewalk contributes to the aesthetic appeal of the neighborhood and can foster a sense of community pride, encouraging residents to use the space more frequently. Additionally, a commitment to cleanliness signals that the area is cared for, which can deter vandalism and further neglect.

Addressing surface conditions is equally important. Uneven or damaged pavements must be repaired promptly to prevent accidents and ensure a smooth, comfortable walking experience. Well-maintained surfaces are crucial for accessibility, especially for elderly pedestrians, children, and people with disabilities. These repairs not only enhance safety but also improve the overall image of the area.

Upgrading lighting is a significant aspect of creating a secure pedestrian environment. Installing sufficient lighting along sidewalks improves visibility during low-light conditions, which can significantly reduce the risk of accidents and deter criminal activity. A well-lit sidewalk promotes evening use, making the neighborhood feel safer and more active after dark.

Clear and accessible signage is another essential improvement. Installing directional signs can guide pedestrians to key destinations, such as parks, public transportation stops, and commercial areas. Effective signage reduces confusion and creates a more navigable urban space, especially for visitors who may be unfamiliar with the area. It also enhances the overall user experience, making the area more pedestrian-friendly.

Engaging the community is vital to the success of these improvements. Hosting workshops and focus groups with local residents can provide valuable feedback on proposed changes and help identify specific needs and concerns. Involving the community fosters a sense of ownership and responsibility, encouraging residents to take an active role in maintaining the sidewalks and reporting any issues.

Finally, a robust system for monitoring and evaluation should be implemented to assess the effectiveness of the improvements. Regular assessments, through surveys and observational studies, will help ensure that the upgraded sidewalks continue to meet the needs of users. This ongoing evaluation allows for adjustments and enhancements to be made based on real-world feedback, ensuring that the changes lead to a truly accessible and comfortable pedestrian space. By focusing on these comprehensive improvements, cities can transform their sidewalks into safer, cleaner, and more inviting public spaces, fostering a vibrant and active community life.

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