



Comfort of A Co-Working Space in A Modern Café in Manado City

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ABSTRACT

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Comfort, Thermal
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working Space
Design.

This study investigates the comfort levels of co-working spaces within modern cafés in Manado City, focusing on three primary environmental factors: thermal, lighting, and acoustic conditions. The emergence of the Work from Café (WFC) trend among the younger workforce underscores the need for adaptive spatial environments that support productivity. Utilizing a mixed-method approach, both quantitative measurements and qualitative perceptions were collected from 34 café visitors actively working during weekdays. Tools such as the Delta Ohm HDTC 32.3, Lux Meter, and Sound Level Meter were employed to assess temperature, light, and noise levels, respectively. The results reveal that thermal comfort is the most influential factor, with air temperature showing a significant positive correlation with perceived comfort, whereas humidity and wind speed had minimal impact. Conversely, lighting intensity and glare were found to have weak correlations with visual comfort, and acoustic measurements indicated a discrepancy between objective noise levels and subjective perceptions, suggesting user adaptation. These findings highlight the divergence between physical measurements and individual experiences in informal workspaces. The study concludes that enhancing thermal conditions, managing acoustics, and re-evaluating lighting design are essential strategies for café operators aiming to optimize their spaces for co-working users. The research contributes to a deeper understanding of environmental comfort in semi-public work settings and offers practical insights for architectural and interior design improvements in modern cafés.

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INTRODUCTION

Among millennial workers, terms such as WFH, WFO, and WFC are very familiar. Since the Covid-19 pandemic broke out, these terms have been used to describe the location where a person carries out their work. The rise of remote work or Work From Home (WFH) emerged as a dominant employment model during the global health crisis, particularly among younger generations who are more adaptable to digital environments (Waizenegger et al., 2020; Molino et al., 2020). As we know, since February 2021, the Indonesian government has implemented various social restriction policies, including restrictions on activities in offices and companies (Yulia, 2021). The term WFH was first introduced, referring to a work-from-home system so that employees do not need to be physically present in the office to complete their tasks. However, this transition also contributed to the rise of Work-Family Conflict (WFC) due to blurred boundaries between professional and domestic roles, especially among millennial workers (Ipsen et al., 2021). In contrast, the return to Work From Office (WFO) has also presented challenges related to employee motivation and psychological well-being (Toscano & Zappalà, 2021).

A few months later, the term WFO or Work From Office appeared. Although working in the office was common before the pandemic, this term has only recently become popular. WFO refers to the condition when workers return to work in the office, often with a flexible choice between working from home or the office, given the Covid-19 cases that still existed at that time. The hybrid work model combining WFO and WFH was adopted to balance productivity and safety (Choudhury et al., 2021). Many companies implemented staggered schedules and reduced occupancy in offices to comply with

health protocols (Carillo et al., 2021). This flexible arrangement was also seen as a strategic response to accommodate employees' psychological needs and ensure work-life balance (Galanti et al., 2021). However, the transition back to WFO revealed challenges related to employee adjustment, communication, and workplace cohesion (Biron et al., 2021). The experience also showed that organizational agility and leadership played key roles in navigating post-pandemic workplace norms (Kniffin et al., 2021).

Then the term WFC also developed, which stands for Work From Café, and is now a trend among workers. Working in a café is considered an attractive alternative because of its different atmosphere, the ability to reduce boredom, and the provision of a fresher working environment (Thatcher & Zhu, 2006). This new work pattern is also supported by the availability of high-speed internet, digital collaboration tools, and flexible job structures that allow location independence (Makarius et al., 2021). Research shows that non-traditional workspaces like cafés can stimulate creativity and improve mood due to ambient noise and informal settings (Mehta et al., 2012; Sundstrom et al., 1994). The role of the office as a workplace is now starting to shift. The office functions more as a place to meet and interact, because in the end, everyone stays focused on their work in front of a laptop (Baldry et al., 2011; Halford, 2005). The hybridization of work locations illustrates a growing preference for autonomy and environmental stimulation in professional routines.

Today, WFC has even become a favorite style of work for the younger generation. Even though pandemic conditions have improved, many workers still choose to work from cafés. Companies are also increasingly giving flexibility in the way they work. The new atmosphere offered by the café can increase focus and morale, as well as provide a solution to overcome boredom at work.

Working in a café has its own uniqueness because it offers an atmosphere that can relieve boredom, improve focus, and provide new inspiration. This is especially relevant for workers in the creative industry, technology, or other fields that require a dynamic and non-monotonous environment. Cafés also provide space for social interaction and informal collaboration, further strengthening the reasons for choosing cafés as an alternative workplace. However, on the other hand, a café is not a specially designed workspace, so the comfort aspect, both physically and psychologically, is an important factor that affects the work experience of visitors.

Based on initial observations at one of the coffee shops in Manado City, this café has a modern interior design and an atmosphere that supports a relaxed environment, making it a popular choice for working outside the office. However, some constraints were identified, such as noise levels coming from customer interactions, room temperatures that were sometimes less consistent due to air conditioning systems being set up for general comfort, and lighting settings that were more oriented towards aesthetics than productivity. This observation shows the need for a space design evaluation to improve comfort for workers who choose the Work From Café (WFC) concept.

In this context, the comfort aspect of the workspace in a café is a challenge in itself, considering that the café space is basically designed for casual social activities, not for intensive work. Comfort aspects such as room temperature, humidity, wind speed, lighting, and space noise are important to study in order to support the productivity and focus of workers in cafés. One of the cafés located in Malalayang, a popular café in Manado City, is an example of a location that has undergone a change in function into an alternative workplace. Although it is attractive in terms of facilities and interior design, not all comfort factors for working can be met optimally.

This study aims to identify and analyze various factors that contribute to the level of workspace comfort in one of the modern cafés in Manado City, both in terms of thermal comfort, lighting, and acoustics. By understanding these elements, it is hoped that this research can provide insight into how the comfort of workspaces in cafés can be improved, as well as provide relevant recommendations for café managers in meeting the needs of working visitors.

This study aims to analyze the factors influencing workspace comfort in modern cafés, focusing on thermal, lighting, and acoustic aspects, and to develop an integrated comfort assessment model. The research specifically examines café visitors who work, read, or study (WFC – Work From Café), excluding those visiting for leisure, with findings generalizable to similar modern café settings. By evaluating these comfort factors, the study seeks to provide café managers with actionable insights for optimizing interior design and facilities to enhance productivity, while helping visitors make informed

choices about suitable workspaces. Additionally, it contributes empirical data and conceptual frameworks for academic research in architecture, interior design, and environmental psychology, offering practical recommendations to improve café environments for work-related activities.

RESEARCH METHODS

This study adopts a mixed methods approach, combining qualitative and quantitative techniques. Qualitative data were gathered through in-depth interviews and field observations to explore visitors' perceptions of workspace comfort in cafés. Quantitative data were collected by measuring variables such as temperature, lighting, and noise levels, and analyzing their relationships within the context of café work environments.

The research process began with a preparation stage, which included a literature review, identification of data needs, preliminary observations, visitor data collection, and management of administrative requirements. The implementation stage involved several steps: conducting a literature review relevant to the research focus, determining sample size and distribution, organizing required data and selecting data collection and presentation methods, conducting interviews with randomly selected respondents, editing, processing, and tabulating collected data, and finally analyzing survey results using Microsoft Excel and linear regression analysis.

Data were collected through interviews and questionnaires distributed to café visitors, focusing on their perceptions of thermal, lighting, and acoustic comfort. Additionally, measurements were taken using tools such as the Delta Ohm HDTC 32.3 for thermal conditions, a Lux Meter for lighting, and a Sound Level Meter for noise. These instruments provided accurate readings of environmental conditions in the café.

The study population consisted of the average number of café visitors on weekdays, specifically between 09:00 and 17:00.

Table 1. Café Visitor Intensity Data per Day

No.	Day/Date	Time	Number of Visitors
1	Monday/24-02-2025	09.12 – 16.04	35
2	Tuesday/25-02-2025	10.30 – 16.24	16
3	Wednesday/26-02-2025	12.32 – 17.08	36
4	Thursday/27-02-2025	10.27 – 17.03	38
5	Friday/28-02-2025	11.38 – 17.01	52
Average visitors			35.4
Rounded corners right			35 Org/day

(Source: 2025 Analysis Results)

In this study, the sample taken was café visitors who carried out work activities. The sampling method used is restricted random sampling, which is a random sampling method with certain limitations or criteria to ensure that the sample meets the requirements or characteristics relevant to the research purpose. Thus, sampling remains random, but only in populations that meet predetermined criteria (simplethings, 2011).

The number of samples to be used is calculated using the Slovin formula as follows:

$$n = \frac{N}{1 + (N \cdot e^2)}$$

Information:

n = Total Samples studied

N = Total Population studied

e = Specified precision (Precision of 95 % then e = 0.05)

It is known that the average number of café visitors per day is 35 people. With a confidence level of 95%, the error tolerance (e) used is 5% (0.05). Based on this, the number of samples to be taken in this study is calculated using the following Slovin formula:

$$= \frac{35}{1 + (35 \cdot 0,05^2)} = 32,1839 = 32$$

To answer the formulation of the problem, this study uses multiple linear regression analysis methods to examine the influence of independent variables such as thermal comfort, lighting comfort, and acoustic comfort on the bound variable, namely comfort level (Y). The process of correlation testing and data calibration is carried out with the help of Microsoft Office Excel software.

The stages in multiple linear regression modeling based on Algifari (2000) are as follows:

- a) Bivariate analysis, Correlation tests are performed to see the relationship between variables, in particular between the independent variable and the bound variable. The free variable must have a correlation significant to bound variables, and between independent variables must not correlate with each other (multicollinearity). If there is a correlation between independent variables, the variable is selected has the strongest correlation to the variables bound to represent.
- b) Multivariate analysis, performed to obtain a multiple linear regression model that most appropriately, describing the influence of one or more independent variables on bound variables.

According to Tamim (2000), the steps of multiple linear regression analysis include:

- 1) Selects the independent variable with the greatest correlation to the bound variable.
- 2) Selecting independent variables that are correlated with each other. If there is a high correlation between the free variables, choose the one that has a greater correlation to the bound variable.
- 3) Forming the equation of the multiple linear regression model as follows:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + \dots + b_nx_n$$

With

Y = Optimal Comfort Value

a = Constant

B1 to BN = Regression Coefficient of Each Independent Variable $x_1, x_2, \dots, x_n$

Data analysis is carried out with the help of a computer using Microsoft Office Excel software to speed up and simplify the data processing process, without doing manual calculations.

RESULTS AND DISCUSSION

Factors That Affect Comfort in Space

This study identified three main factors that affect the level of comfort in the space, especially in cafes that function as co-working spaces. These factors include thermal comfort, lighting, and acoustics. All data was obtained through the perception of café visitors who acted as respondents. The total number of respondents involved in this study was 34 people.

1. Thermal Comfort

Table 2. Respondent Data Results & Thermal Measurements

Respondents	Y _{thermal}	X _{temperature}	X _{wind.speed}	X _{humidity}	PMV	Rounded PMV
1	0	24.11	0.00	52.29	-0.51	-1
2	0	24.11	0.00	52.29	-0.59	-1
3	0	24.11	0.00	52.29	-0.59	-1
4	-1	23.50	0.01	51.27	-1.92	-2
5	-2	23.57	0.02	48.62	-0.44	0
6	-2	23.03	0.08	48.44	-0.80	-1
7	-3	23.03	0.08	48.44	-0.80	-1
8	-1	23.64	0.01	49.57	-0.61	-1
9	-2	22.87	0.04	52.91	-0.84	-1
10	0	24.65	0.07	46.37	-0.15	0
11	0	24.65	0.07	46.37	-0.15	0

12	0	24.65	0.07	46.37	-0.15	0
13	-1	24.23	0.07	48.07	-0.40	0
14	0	24.23	0.07	48.07	-0.40	0
15	-1	21.33	0.50	51.88	-1.56	-2
16	-1	21.33	0.50	51.88	-1.56	-2
17	-1	21.33	0.50	51.88	-1.56	-2
18	-3	21.33	0.50	51.88	-1.56	-2
19	-1	19.97	0.67	49.11	-2.13	-2
20	-2	19.97	0.67	49.11	-2.13	-2
21	-2	19.97	0.67	49.11	-2.13	-2
22	-1	19.97	0.67	49.11	-2.13	-2
23	0	24.77	0.05	48.06	-0.23	0
24	0	24.77	0.05	48.06	-0.23	0
25	0	24.77	0.05	48.06	-0.23	0
26	0	24.77	0.05	48.06	-0.23	0
27	0	24.77	0.05	48.06	-0.23	0
28	0	23.91	0.06	43.89	-0.37	0
29	-1	23.91	0.06	43.89	-0.37	0
30	0	23.91	0.06	43.89	-0.37	0
31	0	23.51	0.13	44.73	-0.58	-1
32	0	23.51	0.13	44.73	-0.58	-1
33	0	23.51	0.13	44.73	-0.58	-1
34	0	23.51	0.13	44.73	-0.58	-1

(Source: 2025 Analysis Results)

Based on the data from a survey in a café, it is known that the respondents are the highest comfortable with the thermal conditions of the room as much as 53% and those who feel somewhat cold as many as 26% and those who feel cold as much as 15%. For more details, you can see the image below.

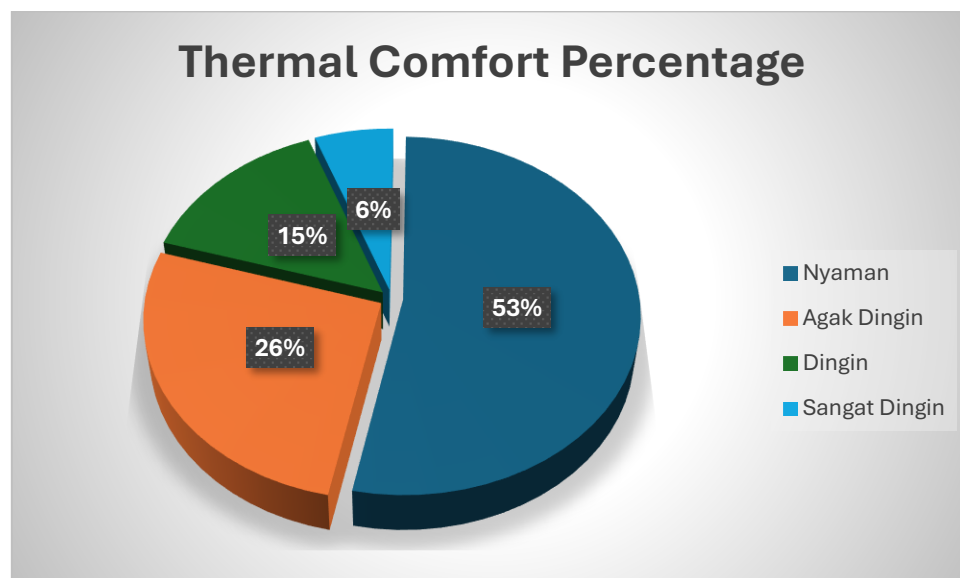


Figure 1. Graph of the percentage of respondents' responses to thermal comfort

(Source: 2025 Analysis Results)

From the results of the survey, it can be seen from the results of the PMV calculation using the Delta ohm Hdtc 32.3 Thermall Comfort tool that the number of respondents who felt comfortable with the thermal conditions of the room was as much as 41% and those who felt a bit cold as much as 32% and those who felt cold as much as 27%. For more details, you can see the image below.

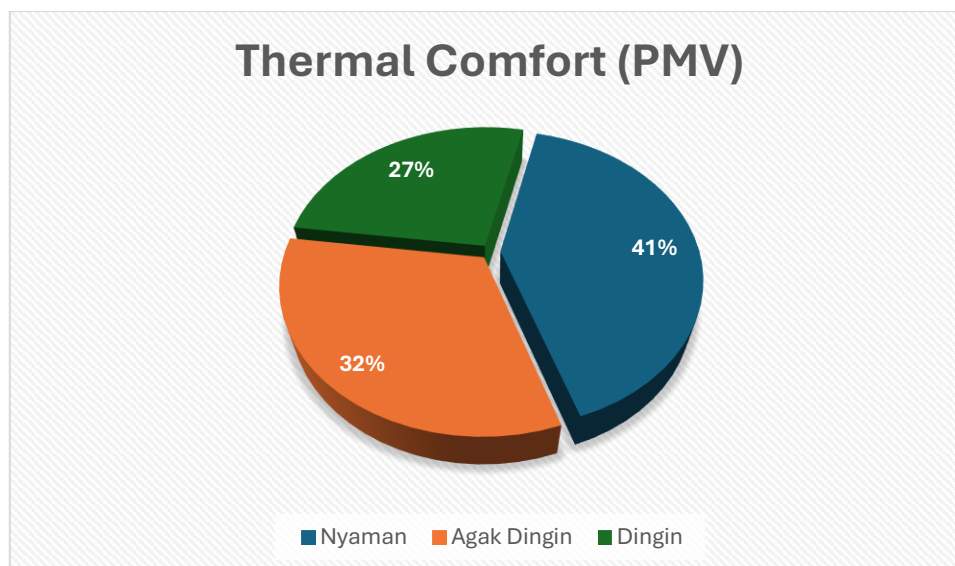


Figure 2. Thermal Comfort Percentage Graph Based on PMV
(Source: 2025 Analysis Results)

Comparison between the results of the respondent's thermal comfort perception and the calculation of the PMV model (Predicted Mean Vote) showed a significant difference in the assessment of the thermal conditions of the workspace in the café. As many as 53% of respondents stated that the condition of the space felt comfortable, while according to the PMV model, only 41% were in the comfortable category. This difference suggests that PMV models tend to underestimate the level of thermal comfort that is subjectively perceived by the user. In addition, PMV indicated that more respondents were in somewhat cold (32%) and cold (27%) conditions, compared to the results of the perception survey which showed 26% and 15% respectively. In fact, there are 6% of respondents who feel very cold, but this condition is not detected by the PMV model. This shows that the PMV model does not yet fully describe thermal comfort in the café space, as it does not take into account subjective factors such as user adaptation and the atmosphere of the space. Therefore, a subjective approach through surveys remains important to complement the results of technical measurements.

2. Visual Comfort (Lighting)

Table 3. Respondent Data Results & Lighting Measurements

Respondents	Y_{light}	X_{lux}	X_{glare}	Light Rating Scale
1	-1	197.47	21.2	-1
2	0	197.47	21.3	-1
3	-1	197.47	19.3	-1
4	-1	152.07	20.6	-1
5	0	77.80	16.1	-2
6	0	26.13	16.4	-3
7	-1	26.13	16.5	-3
8	-1	157.20	20.7	-1
9	0	74.60	20.0	-2
10	0	341.33	19.7	0
11	0	341.33	19.0	0
12	0	341.33	17.6	0
13	0	263.87	19.9	-1
14	1	263.87	19.1	-1
15	2	183.87	18.7	-1
16	0	183.87	22.0	-1
17	1	183.87	21.1	-1

18	0	183.87	21.4	-1
19	1	194.67	18.9	-1
20	0	194.67	21.8	-1
21	1	194.67	18.8	-1
22	0	194.67	19.4	-1
23	0	187.47	15.8	-1
24	1	187.47	15.9	-1
25	1	187.47	16.3	-1
26	0	187.47	14.6	-1
27	0	187.47	18.0	-1
28	-1	134.60	20.9	-2
29	2	134.60	17.2	-2
30	1	134.60	18.5	-2
31	1	329.93	14.4	0
32	0	329.93	18.9	0
33	1	329.93	17.8	0
34	0	329.93	12.9	0

(Source: 2025 Analysis Results)

Based on the data from a survey at a café, it is known that the highest respondents feel comfortable with the lighting conditions of the room as much as 50% and those who feel slightly glare as much as 26% and those who feel glare as much as 6%, while those who feel somewhat dim as much as 18%. For more details, you can see the image below.

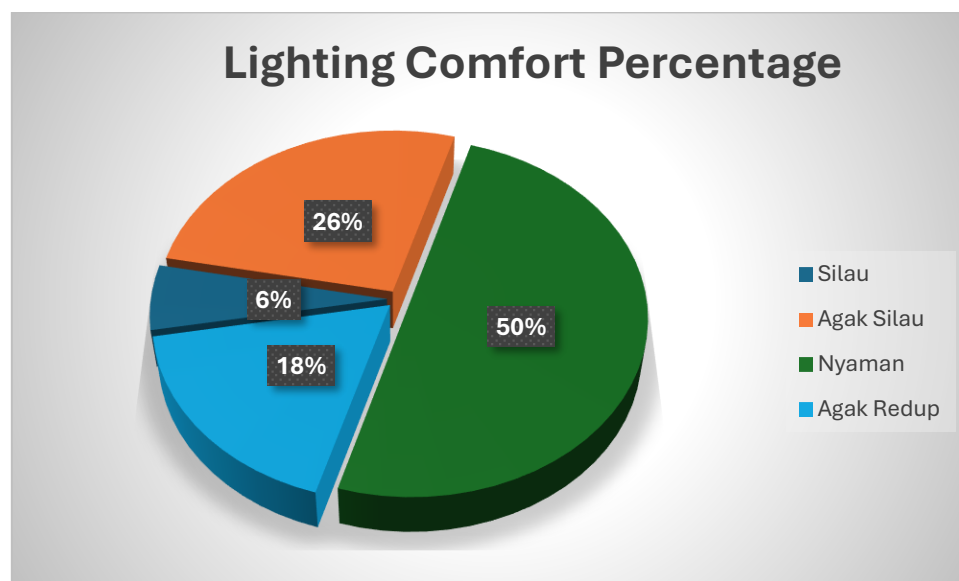


Figure 3. Graph of the percentage of respondents' responses to lighting comfort
(Source: 2025 Analysis Results)

From the results of the survey, it can be seen from the results of measuring the device using a Lux meter and using scoring that has been made previously, that the number of respondents who felt comfortable with the lighting conditions of the room was as much as 20% and those who felt slightly dim as much as 59% and those who felt dim as much as 15%. For more details, you can see the image below.

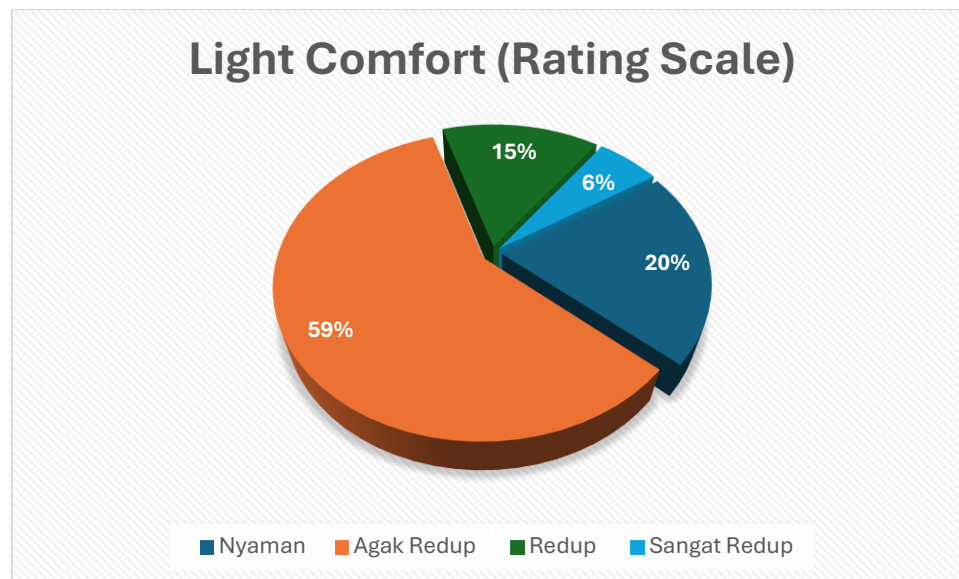


Figure 4. Lighting Comfort Percentage Graph Based on Rating Scale
(Source: 2025 Analysis Results)

Based on the comparison between the results of respondents' perception and the results of the lighting assessment scale made, it was found that there was a difference in views on visual comfort in the café workspace. As many as 50% of respondents stated that the lighting was in a "Comfortable" condition, while based on the technical assessment scale only 20% fell into this category. On the other hand, as many as 59% of the technical assessment results were in the "Somewhat Dim" category, even though only 18% of respondents felt it. This difference suggests that users' subjective perceptions of lighting can be more tolerant or influenced by the context of the activity and the atmosphere of the space, compared to the results of the evaluation based on quantitative parameters. This emphasizes the importance of combining subjective and objective approaches in assessing the comfort of lighting in informal workspaces such as cafes.

3. Acoustic Comfort (Noise)

Table 4. Respondent Data Results & Noise Measurement

Respondents	Y _{noise}	X _{sound}	X _{Humming}	Noise Rating Scale
1	1	65.79	2.50	1
2	0	65.79	2.50	1
3	0	65.79	2.50	1
4	0	59.83	2.50	0
5	1	61.29	2.50	0
6	-1	61.69	2.50	0
7	0	61.69	2.50	0
8	0	65.93	2.50	1
9	0	68.90	2.50	1
10	1	65.33	2.50	1
11	1	65.33	2.50	1
12	1	65.33	2.50	1
13	1	67.81	2.50	1
14	1	67.81	2.50	1
15	0	70.55	2.50	1
16	1	70.55	2.50	1
17	1	70.55	2.50	1
18	1	70.55	2.50	1

19	0	70.32	2.50	1
20	0	70.32	2.50	1
21	1	70.32	2.50	1
22	1	70.32	2.50	1
23	0	70.91	2.50	1
24	1	70.91	2.50	1
25	0	70.91	2.50	1
26	1	70.91	2.50	1
27	1	70.91	2.50	1
28	0	71.68	2.50	1
29	1	71.68	2.50	1
30	1	71.68	2.50	1
31	1	69.61	2.50	1
32	1	69.61	2.50	1
33	0	69.61	2.50	1
34	0	69.61	2.50	1

(Source: 2025 Analysis Results)

Based on the data from a survey at a café, it is known that the respondents felt somewhat noisy about the acoustic condition of the room as much as 56% and those who felt comfortable as much as 41% and those who felt somewhat quiet as much as 3%. For more details, you can see the image below.

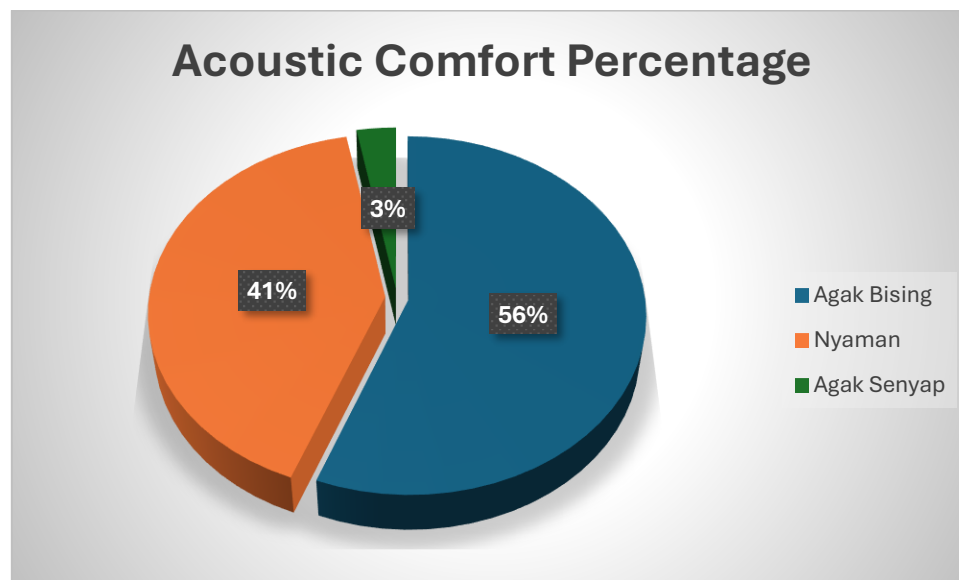


Figure 5. Graph of the percentage of respondents' responses to acoustic comfort
(Source: 2025 Analysis Results)

From the results of the survey, it can be seen from the results of measuring the device using a sound level meter and using scoring that has been made previously, that the number of respondents who felt comfortable with the acoustic condition of the room was as much as 12% and those who felt somewhat noisy as much as 88%. For more details, you can see the image below.

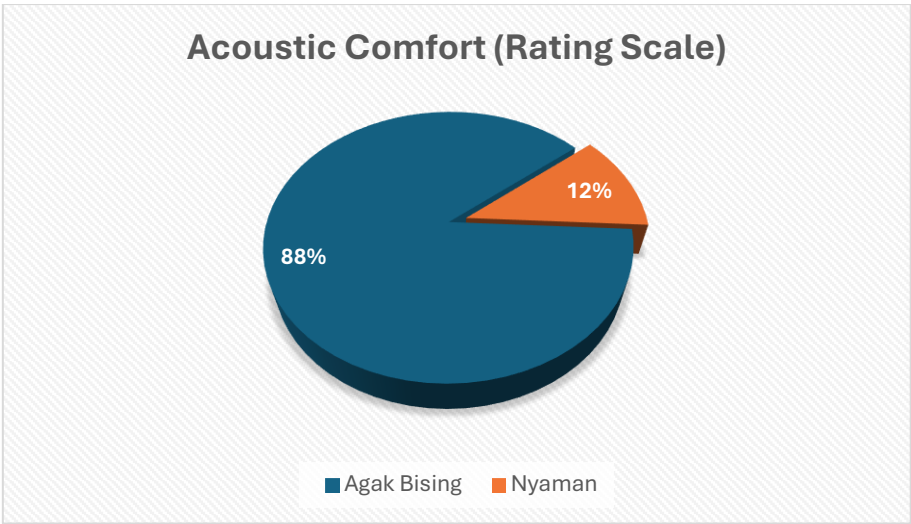


Figure 6. Acoustic Comfort Percentage Graph Based on Rating Scale
(Source: 2025 Analysis Results)

Based on comparative data between the respondents' answers and the results of the assessment scale on noise comfort, it was found that most respondents (41%) felt comfortable, and 56% felt somewhat noisy. In contrast, based on the objective assessment scale, as many as 88% of conditions were rated as somewhat noisy, and only 12% were categorized as comfortable. This shows that there is a difference in perception between the user's subjective comfort and the objective measurement results. Although the noise is considered technically quite high, users can still tolerate it and find the conditions relatively comfortable to work in. This means that there is a level of adaptation or tolerance to noise in the café space, which is an important consideration in the design of an informal workspace architecture.

A. **Global Comfort (Optimal)**

Table 5. Respondent Data Results

Respondents	Y _{global}	Y _{termal}	Y _{light}	Y _{noise}
1	0	0	-1	1
2	0	0	0	0
3	0	0	-1	0
4	-1	-1	-1	0
5	-1	-2	0	1
6	-1	-2	0	-1
7	0	-3	-1	0
8	-1	-1	-1	0
9	-1	-2	0	0
10	0	0	0	1
11	0	0	0	1
12	0	0	0	1
13	0	-1	0	1
14	0	0	1	1
15	0	-1	2	0
16	-1	-1	0	1
17	0	-1	1	1
18	0	-3	0	1
19	0	-1	1	0
20	-1	-2	0	0
21	0	-2	1	1
22	0	-1	0	1

23	0	0	0	0
24	1	0	1	1
25	0	0	1	0
26	0	0	0	1
27	1	0	0	1
28	0	0	-1	0
29	0	-1	2	1
30	1	0	1	1
31	0	0	1	1
32	0	0	0	1
33	0	0	1	0
34	0	0	0	0

(Source: 2025 Analysis Results)

Based on the data from a survey at a café, it is known that the respondents are the highest in feeling comfortable with the condition of the room as much as 71% and those who feel somewhat comfortable, because it is somewhat hot, somewhat global and somewhat noisy as much as 9% and those who feel somewhat comfortable, because it is somewhat cold, somewhat dim and somewhat quiet as much as 20%. For more details, you can see the image below.

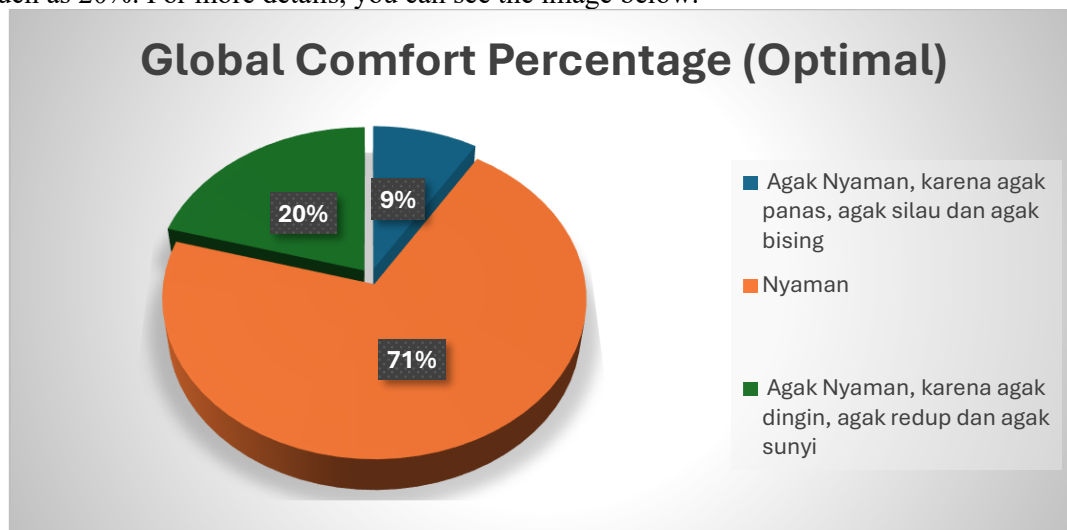


Figure 7. Global Comfort Respondent Answer Percentage Graph (Optimal)

(Source: 2025 Analysis Results)

From all the answers of the respondents above, conclusions can be drawn which can be seen in the graph below.

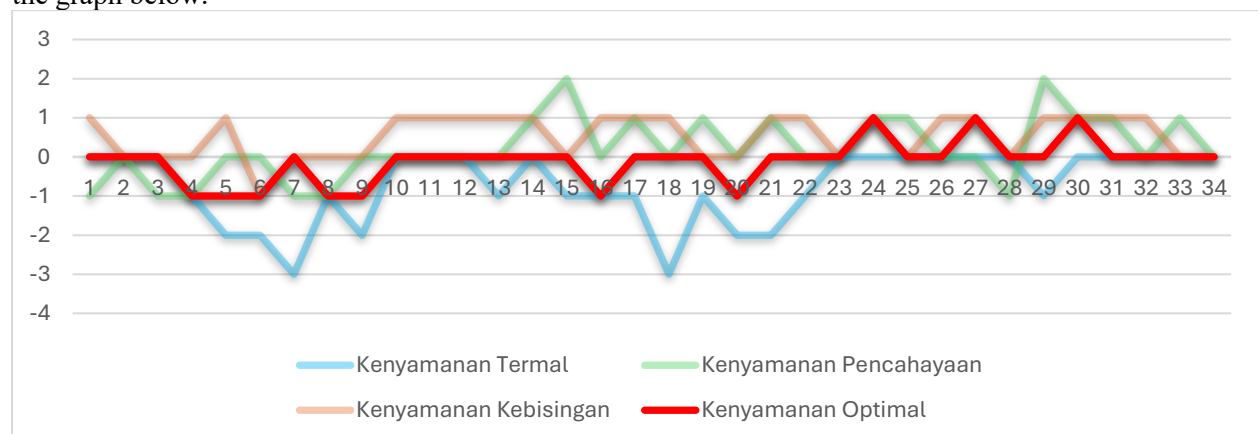


Figure 8. Thermal Comfort, Lighting and Noise Graph Against Optimal Comfort

(Source: 2025 Analysis Results)

It can be seen that the thermal conditions of the room many visitors feel cold, as well as the lighting conditions of the room which many feel a bit glare and the acoustic condition of the room feels a bit noisy. However, the optimal comfort felt by visitors remains as stable in comfort until somewhat comfortable.

Discussion

Table 6. Discussion with Previous Research

Aspects	Research	Method	Key Results	Comparison of Results
Thermal	This research	Measurement of temperature, humidity, wind speed + user perception survey	Temperature has a significant effect on comfort; Wind speed & humidity are not significant	Same as Sujannah: significant temperature; and explicitly use the PMV model
	Sujannah (2019)	PMV + comfort survey at Hana Café	There is a difference between PMV prediction and the user's actual perception of comfort	Equal in importance of temperature; research using PMV but reinforcing the importance of perception
Lighting	This research	Measurement of lux, glare + visual perception correlation	No significant effect was found between lux and glare on visual comfort	Different from Ibrahim & Susilowati and Kusnadi & Pangestu who stated that lighting has a strong influence
	Ibrahim & Susilowati (2023)	Light intensity measurement + SNI standard evaluation	Light intensity according to SNI and supports comfort	The study found no significant effect; likely due to other factors such as the aesthetics of the space
	Kusnadi & Pangestu (2024)	Simulation using LightStanza software is used as a method to obtain data and evaluate the level of quantity and quality of natural lighting in the existing conditions of the building.	Visual comfort in the dining area and bar has not been achieved as natural lighting causes distracting glare. In addition, the dining area next to the atrium is also not comfortable because the lighting is lacking and there is high visual contrast. The use of glass with 50% transparency and changes to the opening elements can help reduce glare and improve natural lighting.	The study found that glare and natural lighting directly negatively impact visual comfort. Meanwhile, in this study, neither light intensity nor glare showed a significant effect on the user's visual comfort.
Acoustics	This research	Noise & buzz level measurement + comfort survey	There was no significant relationship; Noise is considered neutral or part of the atmosphere	Similar to Haapakangas: contextual depending on the type of space; Cafes ≠ offices
	Haapakangas et al. (2017)	Voice surveys and experiments in open offices	Noise negatively impacts performance in the office, but it's contextual	Both state the importance of context: noise is not always negative in social spaces such as cafes

(Source: 2025 Analysis Results)

This study uses correlation and regression analysis methods to test the influence of thermal, lighting, and acoustic aspects on the comfort of workspaces in cafes. This method is in line with the approach used by Sujannah (2019) in her study at Hana Café, Banda Aceh, which combines physical measurements with user perception surveys to understand thermal comfort. Both studies found that air temperature was a major factor influencing thermal comfort, although Sujannah emphasized the importance of differences in users' subjective perceptions of comfortable temperatures, which theoretical models such as PMVs cannot fully predict. This reinforces the importance of including elements of perception in the evaluation of the comfort of the workspace in a café.

In terms of lighting, the results of this study show that light intensity and glare do not have a significant effect on visual comfort, in contrast to the findings of Ibrahim & Susilowati (2023) in Bening Coffee & Space who reported that lighting meets SNI standards and supports the visual comfort of users. Kusnadi and Pangestu (2024) added that lighting comfort is not only determined by quantitative aspects such as lux, but also by qualitative factors such as interior design and natural openings that affect user perception. This suggests that optimal lighting in a café workspace should be viewed holistically, combining physical and psychological parameters.

In the acoustic aspect, the study found that noise and buzz did not significantly affect the acoustic comfort of the user. These findings are similar to the results of Haapakangas (2017) who emphasized that the perception of noise is highly contextual and depends on expectations and spatial functions. Haapakangas points out that high noise levels have a negative impact in open office workspaces, but in social spaces such as cafes, noise can be accepted or even considered part of an atmosphere that supports work comfort. Differences in spatial context were a major factor explaining the variation in results between this study and other studies focusing on formal workspaces.

Overall, comparisons with other literature confirm that the comfort of workspaces in cafes is a multidimensional phenomenon influenced by physical factors and user perception. A research approach that combines quantitative measurement and subjective evaluation is essential to obtain a comprehensive picture of the comfort of the workspace in a café.

CONCLUSION

The analysis of spatial conditions and user perceptions in a modern café in Manado City reveals that workspace comfort is primarily influenced by air temperature, which shows a strong and significant effect on thermal comfort, while humidity and wind speed are less impactful. Lighting and glare demonstrate only weak and insignificant relationships with visual comfort, indicating that current lighting setups in cafés may not adequately support work activities. Similarly, noise levels have a limited effect on perceived acoustic comfort, though acoustic design remains important for a conducive environment. Overall, thermal comfort is the dominant factor, followed by acoustic and lighting considerations. It is therefore recommended that café workspace design prioritize temperature control, efficient air conditioning, and noise management to enhance user comfort and productivity. For future research, it would be valuable to explore the impact of additional environmental and psychological factors—such as furniture ergonomics and social dynamics—on workspace comfort in cafés.

CONCLUSION

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