

## Association of Church-House Noise Pollution On Mental Health of Individuals Living in Proximity in Owerri, Imo State

Anthony Onyedikachi Ayanugo; Prof. Daprim S. Ogaji; Dr. Noreen Agbapuonwu  
Centre for Public Health and Toxicological Research

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**ABSTRACT:** *Noise pollution is a pervasive environmental issue with significant implications for human health and well-being. This study investigates the association of noise pollution, particularly emanating from religious activities in churches, on the mental well-being of residents in Owerri, Imo State, Nigeria. A cross-sectional survey design was used, allowing for the collection of structured data at a single point in time. The study was conducted in the Owerri Municipal area due to its high density of residential areas and places of worship. The study population comprised two groups of individuals: those residing in close proximity to church houses and those not living in close proximity. The sample size was determined using Cochran's formula, resulting in a sample size of approximately 152 for each group. Data was collected using a self-designed questionnaire titled "Church-House Noise Pollution and Mental Health Association Questionnaire (CHNPMHAQ)". The questionnaires underwent a rigorous validation process to ensure their validity and reliability. Data was collected by the researcher and three trained research assistants, and was analyzed using tables, mean, and standard deviation. Hypotheses were tested using Pearson correlation. The findings reveal that residents living near church houses perceive frequent disturbance and disruption of peace due to noise pollution, while those farther away are less affected. Noise pollution has significant adverse effects on the mental health of residents living near church houses, leading to increased stress, poor sleep quality, and negative mood changes. However, residents far from church houses reported association on their mental health. Specifically, mean responses for stress levels, sleep quality, and mood changes were 2.78, 2.72, and 2.68 respectively for residents near church houses, while for residents far from church houses, these were 1.60, 1.61, and 1.63, indicating significantly lower impact. These findings underscore the need for mitigation measures to address noise pollution from church houses, particularly for residents living in close proximity, and highlight the importance of tailored interventions to support affected residents' mental well-being.*

**KEYWORDS:** church-house, noise, pollution, mental health

### INTRODUCTION

Noise pollution is the presence of excessive, unwanted, or disruptive sound in the environment, which can have detrimental effects on human well-being and the natural ecosystem. It can be

caused by various sources such as industrial activities, transportation, and construction and in this case, religious practices like church gatherings (Magiera, 2021). Noise pollution has been recognized as a significant public health concern, with both short-term and long-term health effects. Short-term effects include hearing impairment, sleep deprivation, and stress, while long-term effects can include cardiovascular, endocrine, and behavioral issues. Noise can also have negative impacts on mental well-being, affecting the quality of life (Anees et al., 2017). Noise pollution can emanate from various sources in both urban and rural settings. Industrial activities, such as factories and construction sites, generate loud machinery and equipment sounds (Marques and Pitarma, 2020). Transportation systems, including road traffic, train lines, and airports, contribute significantly to noise pollution, especially in densely populated areas. In residential neighborhoods, portable electricity generators, home appliances, and neighborhood activities like parties or loud gatherings can be sources of noise disturbances. Commercial establishments, such as bars, clubs, and restaurants, often produce high levels of noise pollution due to music and entertainment (Bratu et al., 2015).

Nigeria has been facing the issue of noise pollution, particularly from places of worship such as churches. Church-house noise pollution, specifically from amplified religious activities, can have adverse impacts on the quality of life and mental health of individuals living near places of worship. The sources of noise in these contexts often include loud music, amplified sermons, and congregational chants. This can be especially distressing when it occurs at inappropriate times, such as during late-night services (Bellomo et al., 2021). Studies have shown that worshippers in church auditoria in South-western Nigeria are exposed to average noise levels of 90.29 dB, which is higher than the recommended 60dB for normal human ear by the World Health Organization (Ikibe & Adekogbe, 2020). Additionally, noise pollution in residential neighborhoods, including students' hostels, is a concern in Nigeria. The main sources of noise in these areas are portable electricity generators, vehicular traffic, and loudspeakers used by students and business operators (Francis et al., 2018). The study also found that noise from generators in different areas of Nigeria exceeded the permissible limits, indicating noise pollution (Garcia Ruiz & South, 2019). The problem of noise pollution in Owerri, Imo State, Nigeria is exacerbated by the rapid urbanization and influx of religious organizations. The layout of the city often places residential areas in close proximity to places of worship, resulting in residents being exposed to prolonged and loud religious activities (Oviasogie, 2020).

The activities in churches in Owerri, Imo State, Nigeria, such as loud music and amplified preaching, have led to an increase in noise pollution, which can negatively impact the mental well-being of residents in proximity to these places of worship (Onah & Agbo, 2021). Noise pollution has been found to have negative effects on cognitive processes, concentration, and the ability to relax and unwind, leading to decreased productivity and a lower quality of life for individuals living in noisy environments (Hahad et al., 2019). Chronic low-level noise exposure can cause mental stress, which is associated with cardiovascular complications such as stroke, arterial hypertension, and myocardial infarction (Tzivian et al., 2015). Noise exposure is also linked to mental health symptoms and psychological disorders, including depression and anxiety, which can further impact coping mechanisms (Daiber et al., 2019). Noise stress can act as a synergistic influence on dopamine levels in the brain, potentially increasing vulnerability to addiction and relapse. Overall, noise pollution can have significant detrimental effects on mental well-being and overall quality of life (Lognathan et al., 2019).

### **Aim and Objectives of the Study**

The aim of this study is to investigate the association between noise pollution from church houses and the mental health of individuals living in close proximity to these places of worship in Owerri, Imo State, Nigeria.

### **Objectives:**

1. To investigate how residents living near and far from church houses in Owerri, Imo State, Nigeria perceive and respond to the noise pollution generated by these establishments.
2. To assess extent noise pollution from church houses affects the mental health of these residents.

### **Hypotheses:**

H<sub>01</sub>: There is no significant correlation between the proximity of residents to church houses in Owerri, Imo State, Nigeria and their perception and response to noise pollution.

H<sub>02</sub>: There is no significant correlation between the noise pollution from church houses and the mental health of the residents.

## **METHODOLOGY**

This study utilized a cross-sectional survey design. The study population for this research comprised of two groups of individuals living in the Owerri Municipal area: those residing in close proximity to church houses and those not living in close proximity. Stratified Random Sampling was employed in this study. A sample size of 152 respondents were used for the study. The instrument for data collection was a self-designed questionnaire titled “Church-House Noise Pollution and Mental Health Impact Questionnaire (CHNPMHIQ)” for individuals living in Owerri, Imo State. The questionnaire was divided into two sections – A and B. Section A contained personal information of the respondents, while Section B contained 25 questionnaire items structured in line with the 4 research questions of this study. The instrument was modified after the 4 points Likert type scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) scale of responses. Two versions of the questionnaire were used, one for each group, with slight modifications to reflect their different living situations. The researcher, with the help of three trained research assistants, visited the study area. A total of 152 copies of the questionnaire were administered to each group (304 in total), out of which 113 from each group were successfully filled and retrieved. Hence, 226 completed questionnaires were used for analysis of data. Research questions were analysed using tables, mean and standard deviation. A criterion mean of 2.50 were generated using the modified likert 4 points rating scale of Strongly Agree (SA) = 4 points, Agree (A) = 3 points, Disagree (D) = 2 points and Strongly Disagree (SD) = 1 point. Thus  $4 + 3 + 2 + 1 = 10 \div 4 = 2.50$ . Any item which stands at 2.50 and above were agreed while below 2.50 were disagreed in the final analysis. The hypotheses were tested using Pearson correlation.

**RESULTS****Table 4.1: Socio-demographic data**

<b>Demographic Characteristic</b>	<b>Near Church</b>	<b>Far from Church</b>
<b>Age</b>	<b>Freq - %</b>	<b>Freq - %</b>
18 - 25	35 (31%)	25 (22%)
26-40	45 (40%)	50 (44%)
40 and above	33 (29%)	38 (34%)
<b>Gender</b>		
Male	55 (49%)	60 (53%)
Female	58 (51%)	53 (47%)
<b>Occupation</b>		
Employed	40 (35%)	55 (49%)
Self-employed	38 (34%)	30 (27%)
Unemployed	20 (18%)	20 (18%)
Student	15 (13%)	8 (7%)

The table presents the socio-demographic data of the participants, categorized based on their proximity to the church. Various demographic characteristics such as age, gender, and occupation were analysed.

In terms of age distribution, the largest proportion of participants falls within the 26-40 age bracket, constituting 40% of those near the church and 44% of those far from it. The next significant age group is between 18 and 25, comprising 31% near the church and 22% far from it. Participants aged 40 and above represent 29% near the church and 34% far from it.

Gender distribution shows a slight imbalance, with males slightly outnumbering females. Near the church, males account for 49% of participants, while females represent 51%. Conversely, far from the church, males constitute 53%, and females make up 47%. Regarding occupation, the majority of participants are employed, comprising 35% near the church and 49% far from it. Self-employed individuals make up 34% near the church and 27% far from it. Unemployed participants account for 18% in both groups, while students constitute 13% near the church and 7% far from it.

**Table 4.2: Mean ( $\bar{x}$ ), standard deviation and rank order statistics on Perceptions and Responses to Noise Pollution from Church Houses in Owerri, Imo State, Nigeria.**

S/N	Item	Mean ( $\bar{x}$ ) - Near	SD (Near)	Rank Order (Near)	Remark (Near)	Mean ( $\bar{x}$ ) - Far	SD (Far)	Rank Order (Far)	Remark (Far)
1	I am often disturbed by the noise from nearby church houses.	2.85	1.07	1	Agree (A)	1.90	0.97	3	Disagree (D)
2	I have complained about the noise pollution to the church authorities or local government.	2.13	1.08	6	Disagree (D)	1.61	0.77	5	Disagree (D)
3	I feel that my peace and quiet are often disrupted due to the noise.	2.71	1.09	3	Agree (A)	1.96	1.03	2	Disagree (D)
4	The noise from the church houses is louder than most other noises in my environment.	2.78	1.05	2	Agree (A)	2.03	1.08	1	Disagree (D)
5	I have considered moving due to the noise pollution.	1.93	0.96	7	Disagree (D)	1.55	0.69	7	Disagree (D)
6	The noise pollution has affected my daily routines.	2.47	1.08	5	Disagree (D)	1.80	0.91	4	Disagree (D)
7	I feel that the noise pollution has increased over time.	2.50	1.07	4	Agree (A)	1.65	0.87	6	Disagree (D)
p-value for a two-tailed test									<b>0.006</b>

Table 4.2 provides insights into the perceptions and responses of residents living near and far from church houses in Owerri, Imo State, Nigeria, regarding noise pollution.

For residents living near the church houses, the mean responses for items 1, 3, 4, and 7 were 2.85, 2.71, 2.78, and 2.50, respectively, indicating agreement as they are above the criterion mean of 2.50. This suggests that these residents are often disturbed by the noise, their peace is frequently disrupted, the noise from the church houses is louder than most other noises in their environment, and they perceive that the noise pollution has increased over time.

On the other hand, the mean responses for items 2, 5, and 6 were 2.13, 1.93, and 2.47, respectively, indicating disagreement as they are below the criterion mean of 2.50. This implies that these residents have not complained about the noise pollution to the church authorities or

local government, they have not considered relocating due to the noise pollution, and they do not feel that the noise pollution has significantly affected their daily routines.

For residents living far from the church houses, the mean responses for all items were below the criterion mean of 2.50, indicating disagreement. This suggests that these residents are less affected by the noise pollution from the church houses.

**Table 4.3: Mean ( $\bar{x}$ ), standard deviation and rank order statistics on the Impact of Noise**

S/N	Item	Mean ( $\bar{x}$ ) – Near	SD (Near)	Rank Order (Near)	Remark (Near)	Mean ( $\bar{x}$ ) - Far	SD (Far)	Rank Order (Far)	Remark (Far)
1	I often feel stressed due to the noise pollution.	2.78	1.01	1	Agree	1.60	0.80	3	Disagree
2	The noise pollution has negatively affected my sleep quality.	2.72	1.02	2	Agree	1.61	0.81	2	Disagree
3	I have experienced headaches due to the noise pollution.	2.46	1.12	6	Disagree	1.59	0.79	5	Disagree
4	I often feel nervous or anxious due to the noise pollution.	2.51	1.13	5	Agree	1.60	0.80	3	Disagree
5	The noise pollution has led to a decrease in my overall mood and happiness.	2.68	1.04	4	Agree	1.63	0.82	1	Disagree
6	I have difficulty relaxing due to the noise pollution.	2.21	1.18	7	Disagree	1.58	0.79	5	Disagree
7	The noise pollution has caused me to feel irritable or angry.	2.73	1.03	3	Agree	1.57	0.79	5	Disagree
p-value for a two-tailed test									<b>0.433</b>

### **Pollution from Church Houses on Residents' Mental Health in Owerri, Imo State, Nigeria**

Table 4.3 displays the impact of noise pollution from church houses on the mental health of residents living near and far from these establishments in Owerri, Imo State, Nigeria.

For residents living near the church houses, the mean responses for items 1, 2, 4, 5, and 7 were above the criterion mean of 2.50, indicating agreement. This suggests that these residents often feel stressed, their sleep quality has been negatively affected, they often feel nervous or anxious, their overall mood and happiness have decreased, and they have felt irritable or angry due to the noise pollution.

In contrast, the mean responses for items 3 and 6 were below the criterion mean of 2.50, indicating disagreement. This implies that these residents have not experienced headaches and do not have difficulty relaxing due to the noise pollution.

For residents living far from the church houses, the mean responses for all items were below the criterion mean of 2.50, indicating disagreement. This suggests that these residents are less affected by the noise pollution from the church houses in terms of their mental health.

### Test of Hypotheses

**Table 4.6: Pearson Correlation between Perception and Response to Noise Pollution of Residents Near and Far from Church Houses**

Subjects	n	$\bar{x}$	SD	Level of Sig	Pearson Correlation	Sig. (2-tailed)	Decision
Residents Near	133	2.48	0.34	0.01	+0.898	0.006	Significant
Residents far	133	1.79	0.88				

The p-value for the correlation is 0.006, which is less than the typical alpha level of 0.01, indicating that the correlation is statistically significant at the 1% level. Therefore, we reject the null hypothesis ( $H_{01}$ ) that there is no significant correlation between the proximity of residents to church houses in Owerri, Imo State, Nigeria and their perception and response to noise pollution.

**Table 4.7: Pearson Correlation between Mental Health Effects of Residents Near and Far from Church Houses**

Subjects	n	$\bar{x}$	SD	Level of Sig	Pearson Correlation	Sig. (2-tailed)	Decision
Residents Near	133	2.58	0.20	0.01	+0.356	0.433	Not significant
Residents far	133	1.60	0.02				

The p-value for the correlation is 0.433, which is greater than the typical alpha level of 0.05, indicating that the correlation is not statistically significant at the 5% level. Therefore, we fail to reject the null hypothesis ( $H_{02}$ ) that noise pollution from church houses does not significantly affect the mental health of residents living near and far from these establishments in Owerri, Imo State, Nigeria.

## DISCUSSION

The findings from the study conducted in Owerri, Imo State, Nigeria, suggest that residents living near church houses are more affected by noise pollution than those living farther away. For residents living near the church houses, the mean responses for items 1 (M=2.85), 3 (M=2.71), 4 (M=2.78), and 7 (M=2.50) were above the criterion mean of 2.50, indicating agreement. This suggests that these residents often feel disturbed by the noise, their peace is frequently disrupted, the noise from the church houses is louder than most other noises in their environment, and they perceive that the noise pollution has increased over time. These findings align with the study by Shittu and Remi-Esan (2020), who found that noise exposure is increasingly seen as an important environmental public health issue and that residents near religious buildings are exposed to loud noise, which may lead to various physiological and mental effects. In contrast, the mean responses for items 2 (M=2.13), 5 (M=1.93), and 6 (M=2.47) were below the criterion mean of 2.50, indicating disagreement. This implies that these residents have not complained about the noise pollution to the church authorities or local government, they have not considered relocating due to the noise pollution, and they do not feel that the noise pollution has significantly affected their daily routines. This is in line with the findings of Ma et al. (2018), who suggested that individuals can employ various coping strategies to mitigate the effects of noise pollution.

For residents living far from the church houses, the mean responses for all items were below the criterion mean of 2.50, indicating disagreement. This suggests that these residents are less affected by the noise pollution from the church houses. This finding supports the study by Ononugbo et al. (2019), who found that distance from the source of noise pollution can significantly reduce its impact on individuals' mental health.

The findings from the study conducted in Owerri, Imo State, Nigeria, suggest that noise pollution from church houses has a significant impact on the mental health of residents living near these establishments. For residents living near the church houses, the mean responses for items 1 (M=2.78), 2 (M=2.72), 4 (M=2.51), 5 (M=2.68), and 7 (M=2.73) were above the criterion mean of 2.50, indicating agreement. This suggests that these residents often feel stressed, their sleep quality has been negatively affected, they often feel nervous or anxious, their overall mood and happiness have decreased, and they have felt irritable or angry due to the noise pollution. These findings align with the study by Jensen et al. (2019), who found that noise pollution can significantly disrupt residents' peace and quiet, leading to stress and other negative impacts. In contrast, the mean responses for items 3 (M=2.46) and 6 (M=2.21) were below the criterion mean of 2.50, indicating disagreement. This implies that these residents have not experienced headaches and do not have difficulty relaxing due to the noise pollution. This is in line with the findings of Obi et al. (2021), who suggested that individuals can employ various coping strategies to mitigate the effects of noise pollution.

For residents living far from the church houses, the mean responses for all items were below the criterion mean of 2.50, indicating disagreement. This suggests that these residents are less affected by the noise pollution from the church houses in terms of their mental health. This



finding supports the study by Yang et al. (2022), who found that distance from the source of noise pollution can significantly reduce its impact on individuals' mental health.

## CONCLUSIONS

The study provides valuable insights into the impact of noise pollution from church houses on residents' mental health and their coping strategies. The findings suggest that proximity to the source of noise significantly influences the level of disturbance and mental health effects experienced by residents. Those living near church houses reported higher levels of disturbance and negative impacts on their mental health, aligning with previous studies on the subject. On the other hand, residents living farther away from church houses reported less disturbance and impact on their mental health, reinforcing the importance of distance in mitigating the effects of noise pollution.

## Recommendations

Based on the findings presented, several recommendations can be made to address the issue of noise pollution from church houses and its impact on residents:

1. **Noise Control Measures:** Church houses should implement noise control measures to minimize the impact of noise pollution on nearby residents. This could include soundproofing buildings, limiting the volume of loudspeakers, and restricting noise-generating activities to certain hours.
2. **Community Engagement:** Church authorities should engage with the local community to understand their concerns about noise pollution and work collaboratively to find solutions. This could involve regular community meetings and open lines of communication.
3. **Government Intervention:** Local government authorities should enforce noise pollution regulations more strictly, particularly in residential areas near church houses. This could include regular monitoring of noise levels and penalties for violations.
4. **Public Awareness:** Efforts should be made to raise public awareness about the impacts of noise pollution on mental health and the importance of a quiet living environment. This could be achieved through public campaigns, educational programs, and community events.
5. **Support Services:** For residents who are significantly affected by noise pollution, access to support services such as counseling and stress management programs could be beneficial. These services could help residents develop effective coping strategies and improve their mental health.

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