Assessment of the Environmental Causes of Dampness, the Associated Flora and the Health Implications in the Students' Lodges at College of Health Sciences and Technology, Okofia, Anambra State, Nigeria.

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ABSTRACT

This study assessed the environmental causes of dampness, the associated flora and the health implications in the students' lodges at the College of Health Sciences and Technology, Okofia, Anambra State. The study is to identify the prevalence of molds and dampness, and determine the association between exposure to them and the reported health outcomes A descriptive cross-sectional design was adopted. A total of 154 structured questionnaires were administered and retrieved (100% response rate). Data were analyzed using descriptive statistics and Chi-square tests at a 5% level of significance. Laboratory analysis of surface swab samples were conducted to provide microbiological and environmental validation of findings. Findings revealed approximately 81.8% of respondents reported moderate to high visible *Aspergillusfumigatus, Aspergillusniger, Fusarium species, and Penicillium species* presence, while 81.9% indicated moderate to high dampness signs. Severe mold/dampness conditions were reported by 48.1% of respondents. Respiratory and allergic symptoms were widespread, with 81.8% reporting frequent cough, nasal congestion, and sneezing. More than half (52.6%) experienced symptoms very often, and 82% reported symptom reduction when away from the lodge environment. The Pearson Chi-squared test showed a statistically significant association between mold/dampness exposure and respiratory or allergic health outcomes ($\chi^2 = 42.891$, $p < 0.05$), leading to rejection of the null hypothesis. Laboratory findings confirmed fungal contamination in 55% of sampled surfaces, with fungal loads ranging from 1×10^2 to 2×10^5 cfu/g. Identified isolates included *Aspergillusfumigatus, Aspergillusniger, Fusarium species, and Penicillium species*. Observational assessment further revealed presence of visible mold, inadequate ventilation, leakage and flooding with poor structural conditions as the major environmental causes of dampness in the assessed lodges. The study concludes that mold and dampness are prevalent environmental health hazards in the lodges that were studied at College of Health Sciences and Technology, Okofia and are significantly associated with adverse respiratory outcomes among students Strengthened students housing maintenance policies in higher institution , improved ventilation systems and regular indoor air monitoring in lodges, prompt moisture control, provision of adequate drainage systems and other effective remediation strategies are recommended to enhance lodges' indoor environmental quality and to protect students' health. For further research, a longitudinal survey can be conducted to enhance a more precise and comprehensive results.

Keywords: Dampness, Mold, Lodges, Students, Health.

INTRODUCTION

Mold growth and dampness in buildings are significant public health and structural concerns worldwide.

Dampness in indoor environments provides ideal conditions for mold proliferation, which can lead to severe health risks and material deterioration (Fisk *et al.,* 2023). Mold exposure has been linked to respiratory diseases, allergic reactions, and even mental health issues (Shenassa*et al*., 2022).. Dampness in buildings arises due to factors such as poor ventilation, water leaks, condensation, flooding, and inadequate floor waterproofing. High humidity levels (>60%) create favorable conditions for mold growth (World Health Organization, 2021).

In Nigeria, recent studies found that 70% of the buildings surveyed had visible signs of mold growth, and 60% had dampness issues (Adegun and Adeniran, 2021). The occupants of buildings with mold and dampness issues reported higher rates of respiratory symptoms and allergies. Exposure to mold and dampness was associated with an increased risk of asthma and other respiratory illnesses (Olatunde*et al*., 2020).A comprehensive meta-analysis reported that exposure to dampness and mold in homes is associated with significantly increased risks of asthma and other respiratory disorders, with odds ratios (ORs) ranging from 1.34 to 1.75, indicating a 34% to 75% elevated risk of adverse health effects

Water intrusion through roofs, walls, or plumbing leaks often leads to persistent moisture accumulation, promoting fungal colonization. Mold exposure is associated with an increased risk of asthma and allergic rhinitis. Individuals exposed to damp environments report symptoms such as coughing, wheezing, and nasal congestion (Mendell *et al*., 2022). A meta-analysis found that children exposed to moldy environments had a 30–50% higher likelihood of developing asthma (Tischerand Heinrich, 2021). Certain molds, such as *Stachybotryschartarum*, produce mycotoxins that may cause neurological symptoms, immune dysfunction, and chronic fatigue (Straus, 2023). Long-term exposure to mycotoxins has been linked to inflammation and oxidative stress, which may contribute to chronic diseases.

Specific to student populations, a large-scale study in Canada found that approximately 36% of university students experienced exposure to residential dampness or mold. Among these, there was a significantly higher prevalence of allergic rhinitis and asthma-like symptoms. After controlling for confounders, exposure increased the odds of allergic rhinitis by 1.25 and asthma-like symptoms by 1.70.

While most research has focused on general or childhood populations, emerging data from Nigeria further highlight local relevance. A 2023 epidemiological study in Ibadan revealed a clear exposure–response relationship between residential dampness/mold and severe lower respiratory tract infections among children under five. Children exposed to visible dampness (<0.3 m^2) were over twice as likely (OR ≈ 2.11) to experience severe infections, indicating important implications for environmental health interventions.

Despite mounting evidence of mold-related health risks globally and within Nigeria, research targeting student lodges—especially in institutional settings such as the College of Health, Okofia, is lacking. This context is vital: student lodges often face overcrowding, poor maintenance, and inadequate ventilation, ideal conditions for mold proliferation. Without empirical local data, student housing management remains reactive rather than preventive. Therefore, assessing mold and dampness in these lodges, their health effects on residents, and the effectiveness of remediation strategies is both timely and necessary.

METHODOLOGY

This study adopts a descriptive cross-sectional survey design to assess the reported health outcome of mold and dampness on students residing in lodges at the College of Health, Okofia, and to evaluate effective remediation strategies. The design is suitable because it enables data collection at a single point in time, providing insight into both the prevalence of mold-related health problems and students' awareness of possible interventions.

Study Location

Okofia is located in Nnewi South Local Government Area, Anambra State, Nigeria. The Coordinates**:** is approximately 6.01°N latitude and 6.92°E longitude. Considering the topography, the terrain is characterized by a mix of low-lying areas and gently undulating slopes. Poor drainage systems in certain sections make some lodges prone to water logging and dampness.

Study Duration: January 2025 to December, 2025

Population of the Study

This study focuses on students living in the private lodges around the College of Health, Okofia, Anambra State. Although there are about 10 lodges in the area, a physical observation carried out along with research assistant showed that only 5 of them had noticeable signs of dampness and mold growth. To understand the number of students likely to be affected, we contacted the presidents of these lodges and obtained their occupancy figures. Altogether, the 5 lodges accommodated 250 students. These students make up the study population, since they are the ones directly exposed to the environmental conditions being investigated. The lodges include; God of Abraham Lodge,78 students, Exotic Lodge 50 students, Progress Lodge 22 students, Mount Zion Lodge 60 students, Apple Lodge 40 students. These numbers summed up to 250 students.

Sample Size

Since the total number of students living in the mold-affected lodges is 250, Taro Yamane's formula was used to determine the sample size. A total of 154 students were studied.

Instrument for Data Collection. The main instruments for data collection in this study were;

Structured Questionnaire: The structured questionnaire administered captured the demographic information of the respondents, including age, gender, year of study, department, length of stay in the lodge, and number of occupants; characteristics of the lodges, such as type of lodge, age of the building, floor level, ventilation, water sources, and history of leaks or flooding. It examined the presence and severity of mold and dampness within the lodges, including visible mold, damp spots, musty odor, and other signs of moisture presence. The questionnaire also explored the health impacts of mold and dampness on the respondents, including respiratory and allergic symptoms, clinic visits, and probable medication used. The last section, assessed respondents' knowledge, attitudes, and remediation practices, and gathers their recommendations for improving lodging conditions and controlling mold and dampness.

Observational checklist: This was used to systematically observe and document environmental conditions relevant to the research and to validate students' responses.

Laboratory analysis: This was carried out to provide objective data that support and validate the findings from the questionnaire and observations. Equipment used for laboratory analysis were sterile cotton swabs, sterile sample containers, personal protective equipment (gloves, nose mask, lab coat), microscope (light microscope), glass slides and cover slips, inoculating loop or needle, culture media, incubator, Bunsen burner, distilled water, labels and marker pens.

Inclusion criteria; (1) lodges that present with physical evidence of dampness at the time of study (2) students that have lived up to 2 years as tenants in the selected lodges

Exclusion Criteria: (1) lodges that no evidence of dampness was seen. (2) Occupants of the selected lodges who have not lived up to 2 years.

Method of Data Collection

The questionnaire was administered to each lodge in the ration of the population of the students and to those that met the inclusion criteria. God of Abraham Lodge, 48 questionnaires, Exotic Lodge,30 questionnaires, Progress Lodge, 14 questionnaires, Mount Zion Lodge, 37 questionnaires, Apple Lodge, 25 questionnaires. All the questionnaires were collected back. The observation check lists were also used to gather information on observable conditions and other factors relating to the study such as visible mold, damp spots, musty odor, leaky roof, adequacy of ventilation and condition of drainage systems. Surface swab samples were taken aseptically from the walls and floors of rooms of students that met the inclusion criteria. Twenty swabs were taken from twenty rooms, four randomly selected from each lodge studied to help provide microbial information needed to validate dampness-related disease conditions.

Data analysis

Statistical Analysis: Data collected were analysed for descriptive and inferential statistics using SPSS version 26. Descriptive Statistics include frequency tables, percentages, pie charts and bar charts. Inferential statistics to test hypotheses, and predictors of growth of mold and micro organisms. Pearson Chi-square tests was used for categorical associations.

Table 1. Lodge Characteristics and Environmental Conditions

Table 1, indicates that the highest proportion of respondents (31.8%) resided in shared rooms. This was followed by self-contained apartments (23.4%), room and parlor apartments (22.7%), and other lodge types (22.1%). The predominance of shared accommodations suggests a higher likelihood of overcrowding, which may influence indoor air quality and ventilation.

Regarding the age of buildings, 35.1% of respondents were not sure of the age of their lodge buildings. Among those who were aware, 25.3% reported that their buildings were between 5–10 years old, 20.8% indicated more than 10 years, and 18.8% reported less than 5 years. Older buildings may be more susceptible to structural defects such as cracks, water seepage, and dampness, which can facilitate mold growth.In terms of floor level, the majority of respondents (30.5%) resided on the ground floor, followed by those on the second floor (24.7%) and above the second floor (24.0%). The least proportion (20.8%) lived on the first floor. Ground floor rooms are often more vulnerable to moisture intrusion and flooding, which may increase dampness levels.

Concerning ventilation level, 31.2% of respondents reported inadequate ventilation, while 26.6% reported very inadequate ventilation. Only 28.6% described ventilation as adequate, and 13.6% as very adequate. This indicates that more than half of the respondents perceived their ventilation as poor, which is a critical environmental factor contributing to moisture accumulation and mold proliferation.

With respect to water supply quality, responses were relatively distributed: 26.6% rated it as poor, 25.3% as good, 25.3% as very poor, and 22.7% as very good. Although water supply quality was varied, a considerable proportion perceived it negatively.

Finally, in relation to water leakage or flooding, 38.3% of respondents reported moderate experiences, 22.1% reported highly experienced leakage, and 22.1% reported slight experiences, while only 17.5% reported no experience of leakage or flooding. This suggests that a substantial proportion of lodges experience moisture-related issues, which are major risk factors for dampness and fungal contamination.

Table 1: Lodge Characteristics and Environmental Conditions (n=154)

Variable	Category	Frequency (n=154)	Percentage (%)
Type of Lodge	Other	34	22.1
	Room and parlor	35	22.7
	Self-contained	36	23.4
	Shared room	49	31.8
Age of Building	5–10 years	39	25.3
	Less than 5 years	29	18.8
	More than 10 years	32	20.8
	Not sure	54	35.1
Floor Level	Above second floor	37	24
	First floor	32	20.8

	Ground floor	47	30.5
	Second floor	38	24.7
Ventilation adequacy	Adequate	44	28.6
	Inadequate	48	31.2
	Very adequate	21	13.6
	Very inadequate	41	26.6
Water Supply Quality	Good	39	25.3
	Poor	41	26.6
	Very good	35	22.7
	Very poor	39	25.3
Water Leakage/Flooding	Highly experienced	34	22.1
	Moderately experienced	59	38.3
	Not experienced	27	17.5
	Slightly experienced	34	22.1

Table 2: Mold and Dampness Conditions

Table 2 reveals that 43.5% of respondents reported highly present visible mold, while 38.3% reported moderate presence. Dampness signs were also highly prevalent, with 45.5% indicating high presence. Nearly half (48.1%) rated the severity of mold/dampness as severe. Musty odor was frequently reported, with over 80% indicating often or very often occurrence. Only a small percentage reported absence of mold or dampness. The table demonstrates widespread environmental contamination. Overall, Table 2 confirms high prevalence and severity of mold conditions.

Table 2: Mold and Dampness Conditions (n=154)

Variable	**Category**	**Frequency (n=154)**	**Percentage (%)**
Visible Mold Growth	Highly present	67	43.5
	Moderately present	59	38.3
	Not present	12	7.8
	Slightly present	16	10.4
Dampness Signs	Highly present	70	45.5
	Moderately present	56	36.4
	Not present	12	7.8
	Slightly present	16	10.4
Severity of Mold/Dampness	Mild	13	8.4
	Moderate	52	33.8
	Severe	74	48.1
Musty Odor Frequency	Never	17	11

	Occasionally	11	7.1
	Often	63	40.9
	Very often	63	40.9

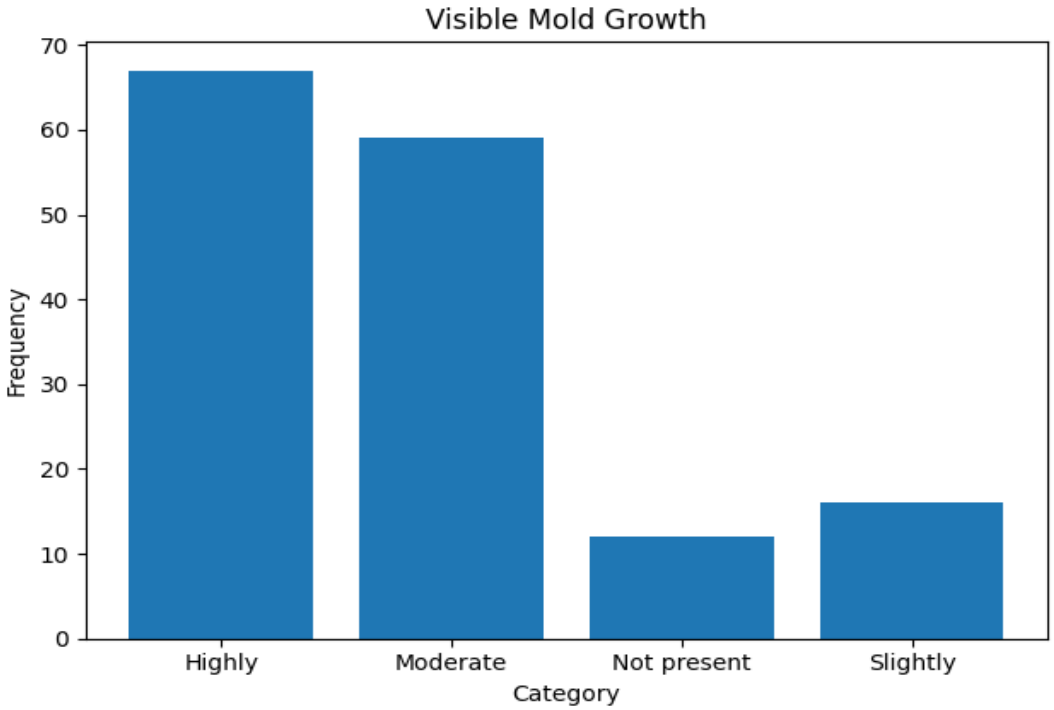

Fig 1: A bar chart showing the visibility of mold growth

Table 3: Health Impacts of Mold and Dampness

Table 3 shows that 81.8% of respondents experienced respiratory symptoms such as cough, nasal congestion, and sneezing. More than half reported experiencing symptoms very often. A large proportion indicated that symptoms reduced when away from the lodge. Clinic visits were common, with many reporting occasional and others frequent attendance. Medication use was high, with nearly half reporting continuous use. Absenteeism from school was also substantial, particularly at severe levels (42.9%). Table 3 therefore indicates significant health consequences associated with exposure and number who absent from school due to the symtoms.

Table 3: Health Impacts of Mold and Dampness (n=154)

Variable	**Category**	**Frequency (n=154)**	**Percentage (%)**
Symptoms Experienced	Frequent cough	126	81.8
	Nasal congestion	126	81.8
	Sneezing/runny nose	126	81.8
Frequency of Symptoms	Often	45	29.2
	Rarely	17	11
	Sometimes	11	7.1
	Very often	81	52.6
Symptom Reduction Away from Lodge	Completely	62	40.3

	Moderately	64	41.6
	Not at all	13	8.4
	Slightly	15	9.7
Clinic/Hospital Visits	Frequently	47	30.5
	Never	11	7.1
	Occasionally	79	51.3
	Rarely	17	11
Medication Use	Continuously used	73	47.4
	Not used	12	7.8
	Occasionally used	16	10.4
	Regularly used	53	34.4
Absenteeism from school due to Symptoms	Moderately	60	39
	Not at all	13	8.4
	Severely	66	42.9
	Slightly	15	9.7

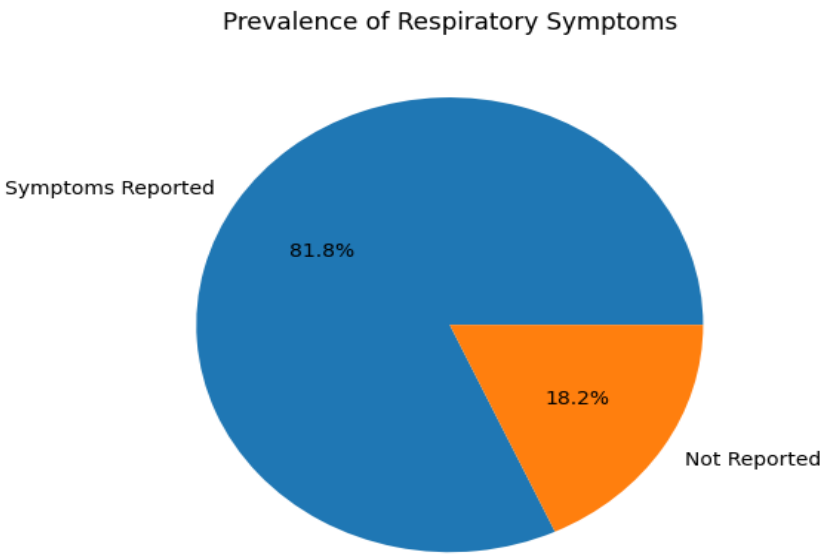

Fig 2: A Pie Chart showing the Prevalence of Respiratory Symptoms

Table 4: Knowledge, Attitudes, and Remediation Practices

Table 4, indicates that awareness of mold-related health risks was moderate among respondents. Reporting to landlords was inconsistent, with a notable proportion not reporting issues. Remediation measures were mostly slightly or moderately applied. Many respondents perceived remediation efforts as not effective or only slightly effective. However, preventive strategies were rated as moderately or very important by all respondents. The table highlights a gap between awareness and effective environmental control. Overall, Table 4 reflects inadequate remediation practices despite recognized importance

Table 4: Knowledge, Attitudes, and Remediation Practices (n=154)

Variable	Category	Frequency (n=154)	Percentage (%)
Awareness Level	Moderately aware	45	29.2
	Not aware	28	18.2
	Slightly aware	41	26.6
	Very aware	40	26
Reporting to Landlord/Caretaker	Always reported	43	27.9
	Not reported	41	26.6
	Rarely reported	31	20.1
	Sometimes reported	39	25.3
Remediation Measures Applied	Highly applied	17	11
	Moderately applied	49	31.8
	Not applied	37	24
	Slightly applied	51	33.1
Remediation Effectiveness	Moderately effective	15	9.7
	Not effective	62	40.3
	Slightly effective	64	41.6
	Very effective	13	8.4
Importance of Recommended Strategies	Moderately important	82	53.2
	Very important	72	46.8

Table 5: Chi-Square Test of Association

Table 5, presents a Pearson Chi-square value of 42.891 with a p-value less than 0.05. The null hypothesis was rejected at the 5% level of significance. This indicates a statistically significant association between mold/dampness exposure and respiratory symptoms. The magnitude of the Chi-square value suggests a strong relationship. The difference observed is unlikely to have occurred by chance. Table 5, therefore provides inferential support for the descriptive findings. Exposure significantly increases health risk.

Table 5: Chi-Square Test of Association

Hypothesis Tested	Statistical Test	Chi-Square (χ^2)	df	p-value	Decision ($\alpha = 0.05$)
Association between Mold/Dampness Exposure and Health Outcomes	Pearson Chi-Square	42.891	1	$p<0.05$	Reject H_0

Table 6: Fungal Load

Table 6, shows that 11 out of 20 samples (55%) recorded detectable fungal growth. Fungal counts ranged from 1×10^2 to 2×10^5 cfu/g. Samples B and G recorded the highest levels of contamination. Several other samples

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showed substantial fungal presence. Nine samples showed no growth. The table confirms microbiological evidence of contamination within the lodges. Overall, Table 6, supports the questionnaire findings with laboratory confirmation.

Table 6: Fungal Load (cfu/g) of Surface Swab Samples the from Selected Lodges

Sample	Fungi Count (cfu/g)
A	1×10^5
B	2×10^5
C	0
D	0
E	0
F	1×10^3
G	2×10^5
H	1×10^5
I	1×10^5
J	1×10^3
K	0
L	1×10^2
M	0
N	1×10^3
O	0
P	0
Q	1×10^5
R	0
S	1×10^5
T	0

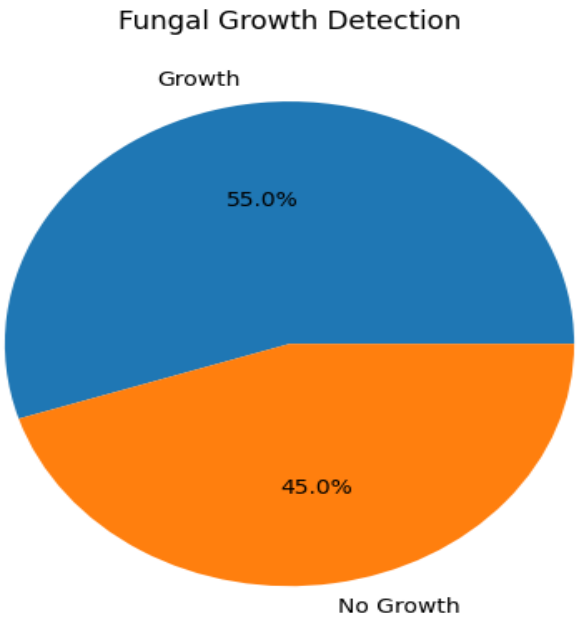

Fig 3: A Pie Chart showing the detection of Fungal Growth

Table 7: Distribution of Identified Fungal Isolates

Table 7, indicates that *Aspergillusfumigatus*, *Aspergillusniger*, and *Fusarium* spp. were each identified in 20% of samples. *Penicillium* spp. accounted for 15%, while 45% showed no growth. The predominance of *Aspergillus* species is significant and may contribute more respiratory health implications. The presence of multiple species suggests mixed contamination. The table confirms active fungal colonization in several lodges. Overall, Table 7 reinforces laboratory evidence of environmental contamination.

Table 7: Distribution of Identified Fungal Isolates

Fungal Species Identified	Number of Samples	Percentage (%)
Aspergillusfumigatus	4	20%
Aspergillusniger	4	20%
Fusariumsp	4	20%
Penicilliumsp	3	15%
No Growth	9	45%

Chi-Square Goodness-of-Fit Test

Table 8, presents the Chi-Square Goodness-of-Fit test conducted to determine whether the observed distribution of fungal growth in the laboratory samples differed significantly from the expected distribution.

Out of the 20 surface swab samples analyzed, 11 samples showed fungal growth, while 9 samples showed no growth. The expected frequency under the null hypothesis assumed equal distribution (10 with growth and 10 without growth).

The Chi-square value obtained was $\chi^2 = 0.200$ with 1 degree of freedom and a p-value of 0.655. Since the p-value is greater than the 5% level of significance ($\alpha = 0.05$), the null hypothesis was not rejected .This indicates that statistically, the observed proportion of samples with fungal growth was not significantly different from an equal distribution. In other words, although fungal contamination was detected in more than half of the samples (55%), the deviation from a 50–50 distribution was not large enough to be considered statistically significant.

However, from a public health perspective, the detection of fungal growth in more than half of the sampled surfaces still confirms the presence of mold contamination within the lodges. The laboratory findings therefore provide microbiological evidence of contamination, even though the statistical dominance of growth over no-growth was not significant at the 5% level.

Table 8: Chi-Square Goodness-of-Fit Test for Presence of Fungal Growth (Laboratory Analysis)

Category	Growth Detected	No Growth	Total	χ^2	df	p-value
Observed (O)	11	9	20			
Expected (E)	10	10	20			
$(O-E)^2 / E$	0.1	0.1				
Test Result				0.2	1	0.655

Table 9 shows the summary of observational check list findings. All the five lodges studied showed, visible mold, graded as either moderate or severe, inadequate ventilation and poor structural conditions. Also as at time of the study, maintenance action was observed in all the five lodges, despite remedial action, three lodges have persistence mold.

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Observational Checklist

Table 9: Summary of Observational Checklist Findings (n = 5 Lodges)

Environmental Indicator	Present	Absent	Percentage Present (%)
Visible mold observed	5	0	100%
Moderate/Severe mold	5	0	100%
Inadequate ventilation	5	0	100%
Poor drainage system	4	1	80%
Stagnant water present	3	2	60%
Roof damaged/leaking	1	4	20%
Structural condition poor/fair	5	0	100%
Evidence of repainting	3	2	60%
Evidence of leak repairs	1	4	20%
Maintenance action observed	5	0	100%
Mold persists despite remediation	4	0	80%

DISCUSSION

The study assessed the Environmental causes of Dampness, the Associated Flora and the Health Implications in Lodges at College of Health Sciences and Technology, Okofia, Anambra, State. Concerning ventilation level in table 1, 31.2% of respondents reported inadequate ventilation, while 26.6% reported very inadequate ventilation. Only 28.6% described ventilation as adequate, and 13.6% as very adequate. This indicates that more than half of the respondents perceived their ventilation as poor, a critical environmental factor contributing to moisture accumulation and mold proliferation.

Again, in relation to water leakage or flooding, 38.3% of respondents reported moderate experiences, 22.1% reported highly experienced leakage, and 22.1% reported slight experiences, while only 17.5% reported no experience of leakage or flooding. This suggests that a substantial proportion of lodges experience water leakages and floodings, which are major risk factors for dampness and fungal contamination.

The findings from Table 2, revealed a high prevalence of mold and dampness within the lodges. A substantial proportion of respondents reported moderate to severe visible mold growth and dampness signs. Additionally, persistent musty odor was frequently reported, indicating ongoing fungal activity. These results suggest that mold contamination is widespread and severe in many lodges.

Laboratory analysis further confirmed identification of active microbial presence of species such as *Aspergillusfumigatus*, *Aspergillusniger*, *Fusarium* spp., and *Penicillium* spp. in the lodge environment.

These findings are consistent with previous studies which have reported that damp indoor environments significantly promote fungal proliferation. Research by Mendell, Mirer, Cheung, Tong, and Douwes (2020) found strong evidence linking damp buildings with increased mold growth and microbial contamination. Similarly, Fisk, Lei-Gomez, and Mendell (2021) reported that buildings with moisture problems tend to have elevated fungal counts and visible mold presence.

The agreement between the questionnaire findings and laboratory results strengthens the validity of the evidence for mold contamination in the lodges.

The study also revealed a high prevalence of respiratory symptoms among respondents. A large proportion reported frequent cough, nasal congestion, and sneezing/runny nose. More than half of the respondents indicated experiencing symptoms very often, and a significant proportion reported symptom reduction when away from the lodge environment. This suggests a strong environmental relationship with the health complaints.

The Pearson Chi-square test showed a statistically significant association between mold/dampness exposure and health symptoms ($\chi^2 = 42.891$, $p < 0.05$). This indicates that students residing in environments with moderate to severe mold/dampness were significantly more likely to experience respiratory or allergic symptoms than those in less affected lodges.

These findings align with existing literature. Fisk, Eliseeva, and Mendell (2010) reported that indoor dampness and mold exposure are associated with increased risks of asthma, wheezing, and respiratory infections. Similarly, Quansah, Jaakkola, Hugg, Heikkinen, and Jaakkola (2012) found that children and young adults exposed to indoor mold were at increased risk of developing asthma and allergic rhinitis.

The improvement of symptoms when respondents were away from the lodge further supports the environmental origin of the health problems, reinforcing the causal plausibility of the association.

Although a reasonable proportion of respondents were moderately or very aware of the health risks associated with mold and dampness, remediation practices were reported to be inadequate. Many respondents indicated that remediation measures were either slightly applied or not applied at all. Furthermore, most respondents rated remediation efforts as not effective or only slightly effective. These findings suggest a gap between awareness and effective environmental control. Similar observations have been reported in housing and environmental health studies, where inadequate building maintenance and delayed remediation contribute to persistent mold problems (WHO, 2009). Studies have shown that ineffective remediation often results from superficial cleaning without addressing the underlying moisture source.The high proportion of respondents who considered preventive strategies important indicates a willingness to adopt improved environmental management measures, provided appropriate structural and administrative support is available.

The findings of this study demonstrate a consistent pattern: Environmental conditions (poor ventilation and water leakage) create favorable conditions for dampness and dampness promotes fungal growth. Exposure to mold/dampness is significantly associated with respiratory and allergic symptoms; Current remediation practices are inadequate and perceived as ineffective.

The consistency between descriptive findings, inferential analysis, and laboratory confirmation enhances the credibility of the results.

Overall, the findings proved that mold and dampness constitute a significant environmental health problem in lodges at the College of Health, Okofia, with measurable health implications for students.

CONCLUSION

The findings of this study have significantly revealed a high prevalence and severity of mold and dampness conditions within the lodges. A substantial proportion of respondents reported visible mold growth, dampness signs, and persistent musty odor. Laboratory analysis further confirmed fungal contamination in more than half of the sampled surfaces, with the identification of species such as *Aspergillus*, *Fusarium*, and *Penicillium*, which are known to have respiratory health implications.Inferential analysis demonstrated a statistically significant relationship between exposure to mold/dampness and the prevalence of respiratory or allergic health problems among students. Students residing in moderately to severely affected lodges were significantly more likely to report frequent respiratory symptoms, medication use, clinic visits, and absenteeism from classes. The reduction of symptoms when away from the lodge environment further supports the environmental origin of the health complaints.

In conclusion, mold and dampness constitute a significant environmental health problem in lodges at the College of Health, Okofia, Anambra State with measurable adverse effects on students' respiratory health. The presence

of mold and dampness was proven to be associated with inadequate ventilation, defective drainage system and poor structural maintenance and other factors. Strengthened students housing maintenance policies in higher institution , improved ventilation systems and regular indoor air monitoring in lodges, prompt moisture control, provision of adequate drainage systems and other effective remediation strategies are recommended to enhance lodges' indoor environmental quality and to protect students' health. For further research a longitudinal survey can be conducted to enhance a more precise and comprehensive result.

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Questionnaire

Title: **Assessment Of The Environmental Causes Of Dampness, The Associated Flora And The Health Implications In The Students' Lodges At College Of Health Sciences And Technology, Okofia, Anambra State, Nigeria.**

All responses will be treated with strict confidentiality and anonymity.

The information provided will be used solely for research and academic purposes.

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. Age (years): _____

2. Gender:

a) Male ☐

b) Female ☐

c) Prefer not to say ☐

d) Other ☐

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3. Department: _____

4. Length of stay in the current lodge:

a) Less than 6 months ☐

b) 6–12 months ☐

c) 1–2 years ☐

d) More than 2 years ☐

5. Number of occupants in the room:

a) One ☐

b) Two ☐

c) Three ☐

d) More than three ☐

Section B: Lodge Characteristics And Environmental Conditions

6. Type of lodge:

a) Self-contained ☐

b) Room and parlor☐

c) Shared room ☐

d) Other ☐

7. Approximate age of the building:

a) Less than 5 years ☐

b) 5–10 years ☐

c) More than 10 years ☐

d) Not sure ☐

8. Floor level of your room:

a) Ground floor ☐

b) First floor ☐

c) Second floor ☐

d) Above second floor ☐

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9. Level of ventilation in the room:

a) Very inadequate ☐

b) Inadequate ☐

c) Adequate ☐

d) Very adequate ☐

10. Quality of water supply in the lodge:

a) Very poor ☐

b) Poor ☐

c) Good ☐

d) Very good ☐

11. Extent of water leakage or flooding experienced in the lodge:

a) Not experienced ☐

b) Slightly experienced ☐

c) Moderately experienced ☐

d) Highly experienced ☐

Section C: Mold And Dampness Conditions

12. Presence of visible mold growth in the room:

a) Not present ☐
b) Slightly present ☐
c) Moderately present ☐
d) Highly present ☐

13. Presence of dampness signs (wet walls, peeling paint, damp smell):

a) Not present ☐
b) Slightly present ☐
c) Moderately present ☐
d) Highly present ☐

14. Severity of mold or dampness in the room

a) None ☐
b) Mild ☐
c) Moderate ☐
d) Severe ☐

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15. Frequency of musty or damp odor noticed:

a) Never ☐
b) Occasionally ☐
c) Often ☐
d) Very often ☐

Section D: Health Impacts Of Mold And Dampness

16. Have you experienced any of the following symptoms since staying in this lodge? (Tick all that apply)

Frequent cough ☐

Sneezing/runny nose ☐

Nasal congestion ☐

Wheezing/difficulty breathing ☐

Chest tightness ☐

Skin rashes/itching ☐

Eye irritation ☐

Headaches ☐

Fatigue ☐

None ☐

17. Frequency of these symptoms:

a) Rarely ☐
b) Sometimes ☐
c) Often ☐
d) Very often ☐

18. Extent to which symptoms reduce when away from the lodge:

a) Not at all ☐
b) Slightly ☐
c) Moderately ☐
d) Completely ☐

19. Frequency of clinic or hospital visits due to these symptoms:

a) Never ☐
b) Rarely ☐
c) Occasionally ☐
d) Frequently ☐

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20. Extent of medication use for these symptoms:

a) Not used ☐
b) Occasionally used ☐
c) Regularly used ☐
d) Continuously used ☐

21. Extent to which symptoms cause absenteeism from classes:

a) Not at all ☐
b) Slightly ☐
c) Moderately ☐
d) Severely ☐

Section E: Knowledge, Attitudes, Remediation Practices, And Observations

22. Level of awareness that mold and dampness can affect health:

a) Not aware ☐
b) Slightly aware ☐
c) Moderately aware ☐
d) Very aware ☐

23. Extent of reporting mold or dampness issues to the landlord/caretaker:

a) Not reported ☐
b) Rarely reported ☐
c) Sometimes reported ☐
d) Always reported ☐

24. Extent of remediation measures applied in the lodge:

a) Not applied ☐
b) Slightly applied ☐
c) Moderately applied ☐
d) Highly applied ☐

25. Effectiveness of remediation measures:

a) Not effective ☐
b) Slightly effective ☐
c) Moderately effective ☐
d) Very effective ☐

26. Importance of recommended strategies for preventing mold and dampness:

a) Not important ☐
b) Slightly important ☐
c) Moderately important ☐
d) Very important ☐

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Observational Checklist:

TITLE: Assessment Of The Environmental Causes Of Dampness, The Associated Flora And The Health Implications In The Students' Lodges At College Of Health Sciences And Technology, Okofia, Anambra State, Nigeria

SECTION A: LODGE IDENTIFICATION

1. Lodge Name:

2. Location:

3. Number of Floors:

4. Approximate Number of Rooms:

5. Date of Inspection:

SECTION B: MOLD AND DAMPNESS CONDITIONS

6. Evidence of visible mold in common areas (corridors, stairways, bathrooms):

☐ Yes ☐ No

7. Areas where mold is observed (tick all that apply):

☐ External walls

☐ Internal corridors

☐ Shared bathrooms/toilets

☐ Staircases

☐ Roof/ceiling areas

☐ Other: Walls of the rooms

8. Signs of dampness in the building (tick all that apply):

☐ Cracked walls

☐ Water stains

☐ Peeling paint

☐ Roof leakage

☐ Rising damp from ground

☐ Musty odor

☐ None observed

9. General severity of mold/dampness in the lodge:

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☐ None ☐ Mild ☐ Moderate ☐ Severe

SECTION C: ENVIRONMENTAL AND STRUCTURAL CONDITIONS

10. General ventilation of the building:

☐ Adequate ☐ Inadequate

11. Drainage system around the lodge:

☐ Good ☐ Fair ☐ Poor

12. Evidence of stagnant water around the building:

☐ Yes ☐ No

13. Roof condition:

☐ Good ☐ Fair ☐ Damaged/Leaking

14. Overall structural condition of the building:

☐ Good ☐ Fair ☐ Poor

SECTION D: REMEDIATION PRACTICES AND MAINTENANCE

15. Evidence of recent repainting:

☐ Yes ☐ No

16. Evidence of leak repairs:

☐ Yes ☐ No

17. Evidence of routine cleaning of common areas:

☐ Yes ☐ No

18. Maintenance response to damp/mold problems appears:

☐ Prompt ☐ Delayed ☐ No action observed

19. Mold/dampness persists despite remediation:

☐ Yes ☐ No