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Survey on Environmental, Ergonomic and Occupational Health Hazards and Safety of Teachers and Researchers in Academic Institutions in Ebonyi State

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Work-related health hazards arising from environmental, ergonomic, and occupational factors among teachers and researchers in Nigerian academic institutions have long been neglected. This study aimed to investigate the prevalence and nature of such hazards among teaching staff in Ebonyi State, Nigeria. A descriptive survey was conducted across three educational zones, involving 12 schools selected through convenience sampling from tertiary, secondary, and basic education levels. A total of 200 teachers and researchers were sampled using simple random sampling, with 150 valid responses received (75% response rate). Data were collected using a 43-item questionnaire comprising open-ended, closed-ended, contingency, and matrix-type questions. Frequencies and percentages were computed to summarize responses. The results revealed that 88% of respondents held professional teaching qualifications and had over two years of teaching experience. However, 98% reported experiencing work-related ailments linked to ergonomic issues (e.g., uncomfortable furniture), teaching aids, occupational safety deficiencies, and poor physical and social environments. Specifically, 62% reported persistent health issues, 76% attributed health problems to school furniture, 86% suffered from work-related stress due to workload, 82% reported the absence of fire extinguishers in their schools, and 89% lacked training in fire-fighting device operation. Based on these findings, the study recommends that government, policymakers, and educational stakeholders integrate teacher health and safety into Nigeria's occupational health and safety management standards, with particular attention to Ebonyi State.

Keywords: occupational health hazards, ergonomic risks, teacher safety, work-related stress, school environment

Introduction

The concept of ergonomics can be traced to ancient Greece in the 5th century B.C., where evidence suggests that ergonomic principles were applied in the design of tools, jobs, and workplaces. Various organizations have proposed definitions of environmental, ergonomic, and occupational health hazards and safety. The International Ergonomics Association (IEA, 2008) defines ergonomics as the scientific discipline concerned with understanding interactions among humans and other elements of a system, and the profession that applies theory,

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principles, data, and methods to design in order to optimize human well-being and overall system performance. The IEA categorizes ergonomics into physical, cognitive, organizational, and environmental specializations applicable to all occupational sectors.

In the late 1960s, the Occupational Safety and Health Administration (OSHA) in the United States adopted ergonomic and occupational health and safety principles following the failure of earlier workers' safety policies. These principles were subsequently enforced through the Occupational Safety and Health Act of 1970 (MacLaury, 1984).

In Nigeria, and Ebonyi State in particular, the health and safety of employees across various occupational sectors are supported by the Nigeria Labour Act (Cap 198, 1990) and the Employee's Compensation Act of 2010. These legal frameworks are designed to ensure that employees are not exposed to conditions that would lead to work-related injuries or illnesses. Employees are also required to exercise their duty of care by adhering to employers'standard operating procedures, which must incorporate safety and health requirements. However, it remains unclear whether Nigerian workers—particularly teachers and researchers—and their employers are fully aware of their safety and health responsibilities and obligations.

Ergonomic and occupational health hazards are common across many occupations, and teaching is no exception. Teachers face a range of hazards, some common to all teachers and others specific to particular subject areas. Occupational illnesses are often not easily identified as injuries and frequently go unreported, especially when the link between exposure and symptoms is not clearly established (Reese, 2009). This may explain the low number of reported injuries and illnesses among teachers. Regrettably, little is known about the severity and frequency of accidents among teachers (Litch, 1973). The situation is further aggravated by the lack of effective legislation guiding Ergonomic and Occupational Health and Safety (EOHS) management in schools, inadequate funding, and changing technology. In addition, teachers appear to lack awareness of the importance of reporting near-miss incidents.

WHO (World Health Organization) (1996) writes,

> In the most favorable circumstances work provides the income and quality outcomes and also has positive impact on social, psychological and physical health and well-being. In spite of these the fact that conditions at work and work environment, in many countries still involve distinct and even severe hazards to health that reduces the span of working of individuals. (http://www.who.Int/occupationalhealth/publications/globstrateg y/en/print.html)

As stated early in the first paragraph about the categories of ergonomics in major occupations, there are physical hazards, cognitive hazards, organizational hazards, and environment hazards which affect workers who operate at the place of work; these hazardous factors can influence occupational health discomforts of teachers and researchers. Aryal (2007) opined that most teachers faced numerous physical and psychological problems as a result of work load and stress at the school. Hazards arises from psychosocial environment as well as working hours and physical agents. In the teaching profession, teachers and researchers are exposed to combination of hazards e.g., noise, shift work, stress (Smith, Namara, & Wellens, 2004). Work and ergonomic factors may be harmful to health and working capacity, and equal number of working people report psychological overload at work resulting in stress symptoms (Lysons, 1996).

Occupational health hazards can threaten the health of many workers. In some cases, materials involved in a person's job may result to a long terms damage that appears only after many years (http://www.doreasdezines. com, 2001). Teachers and researchers in our country's institutions face a series of problems within the school the

same at home as a result of school associated causes. There are some strategies that have been adopted by employer (government and private owners) that monitors the increasing performance, such as use of incentive schemes and numerous reform measures like awarding study leaves and other incentives to the deserving teachers and researchers, and better remuneration. However, the health hazard that is associated with the work which ranges from physical to psychosocial has been trampled upon by the employers (Milan, 2011). Therefore, this study seeks to contribute to the development of education in the country by investigating the potential ergonomic and occupational health hazards and safety of teachers and researchers and the need to inform those in the authority to factor it into the national occupational health and safety management standard.

Statement of the Problem

Occupational health has received increasing attention in recent years as a result of mounting concerns over exposure to carcinogens in the workplace (http://www.doreasdezines.com, 2001). The duties of teachers and researchers in Ebonyi State are not only limited to teaching or lecturing in classes. However, it involves additional work which may require extra hours in order to discharge the other duties like preparing for lessons (lesson planning), assessing students exercises, preparing teaching/learning resources (such as charts), laboratory work with students, the use of laptops by tertiary institution lecturers to carry on their research work, carrying out guidance and counseling of students, performing non-teaching clerical duties, and satisfying requests from management. They also head the institution (principals), department, and classes, take charge of home science room, computer lab, and workshops (in case of woodwork and metalwork), maintain students discipline both inside and outside classrooms, and train students for different sports and games. They too, accompany students to field visits and other trips. As a result, teachers are exposed to many occupational health, safety, and environmental hazards, emanating from their variety of job functions (Kuria, 2009).

NUT (2012) writes,

> Most teaching staff spend most of their working hours each day on their feet teaching or lecturing and due to the seating arrangement in the classroom, on lifting and handling, working with computers, health and safety when using computers at home and inhaling certain chemicals from laboratory are also at greater risk of health problems including: varicose veins; poor circulation; bunions/corns, painful swelling in the feet and legs; foot problems; joint damage, low back pain, heart and circulatory problems; and specific problems in the case of pregnant women, including pre-term birth, spontaneous abortions and slower foetal growth rates. (www.teacher.org.uk, 2008)

The causes of health hazards of teachers and researchers are not fully known. The working environment exposes many teachers to health hazards that lead to injuries in vocal cord, respiratory diseases, cancer, musculoskeletal disorder, reproductive disorders, mental and neurological illness (WHO, 1996). The positive impact of introducing Occupational Safety, Health and Environment (OSHE) management systems at the organizational level, both on the reduction of hazards and risks and on productivity, is now recognized by employers and governments (I.L.O., 2001). In U.K. for example, adherence to OSHE regulations in all workplaces, is enforced by Health and Safety Executive (HSE) created through an act of parliament (http://www.legislation.hmso.gov.uk, 2001). In U.S.A. the same is done by occupational safety and administration in the department of labor (http://www.OSHA.gov, 1990).

In the case of Ebonyi State, even though the state has different agencies like the Environmental Protection Agency, Department of Factory Inspectorate, Inspectorate Division of the Nigeria Minerals Commission, and the Ebonyi State Labor Commission and other agencies under different jurisdictions which monitor different

industries for workplace and employee safety, however, there is no national body, policy, nor process that govern Occupational Safety & Health management in Abakali. So this study aims to bring into light some ergonomic and occupational health hazards that affect teachers and researchers in the teaching profession in our institution ranging from basic schools, secondary schools, and tertiary schools (colleges of educations, polytechnics, health institutions (nursing training schools) and the universities) in the country in the state.

General Objective

The general objective of this study is to establish the fact that teachers and researchers in the country's institutions encounter certain ergonomic and occupational health hazards in their work, Ebonyi State as a case study.

Specific Objectives

The following are the specific objectives of the research:

1. To find out the physical and psychological occupational health hazards among teachers and researchers in our schools.

2. To determine the causes of ergonomic and occupational health hazards among teachers and researchers in our schools.

3. To examine whether occupational safety has any effect on the performance of the teachers and researcher in their work.

4. To examine the extent to which the seating conditions and other gadgets used affect teacher's health either in the classroom or in the office.

Significance of the Study

The study revealed the possible ergonomic and occupational health hazards associated with the teaching profession and which normally affect the teachers and researchers who work in such environment. The outcome of this study will be useful to the teachers and researchers in our schools to be sensitized on the need to observe safety, health, and the care of social and physical environment, whether at work or at home in order to avoid any consequences that will impede their work efficiency. They would also benefit from the results of the study as this may be used to institute certain intervention measures. It would be useful for safety designers in the educational sector to consider teachers and researchers from different perspective which may include (stature, weight etc.) in their design of equipment like office tables and seats, desks, cupboard, and office book shelf in the schools in Ebonyi States.

The study would also be beneficial to the public policy makers as they would understand that the teaching profession has a wide range of hazards that need certain consideration when formulating policies so that they can have some compensations due to the ill-health injuries they experience at the work which sometimes seem unreported for the law to take its course as enshrined in the Workmen's Compensation Act 1987 (PNDCL 187) Section 2. It would also benefit the government to realize the need of establishing a body or an agency to take charge of Ergonomic and Occupational Health and Safety issues that exist in our workplaces and workers as a whole, especially teachers in Ebonyi State. They would also provide data useful for planning purposes. Finally, it would be useful to the academia and researchers as it will contribute to a new knowledge.

Scope of the Study

The study is focused on the ergonomics and occupational health hazards that are associated with the teaching

profession in Ebonyi State school system. The total sample size of teachers and researchers was 50% which ranged from primary to the tertiary institutions.

Research Questions

1. Have you ever experienced any hazards in the course of work before?
2. What were causes of the hazards you encountered?
3. Do the hazards have any influence on your performance as a teacher or researcher?
4. Have you ever been affected by the tables and chairs you use in your office or classroom before?

Research Methodology

Introduction

This section of the paper describes the methodology that was used to conduct the study. This includes location and demography of the study area, research design, target population, sample size, sampling procedure, research instruments, data collection procedures, and data analysis techniques.

Research Design

A research design is a plan showing how the problem under investigation can be solved (Orodho, 2003). It functions as the research blue print (Crezwell, 2003). To tackle the questions posed in this study, the researcher used descriptive survey. Mugenda (1999) noted that a survey research attempts to collect data from members of the population and describes the existing phenomena by asking individuals about their perception, attitudes, behavior, and values. Descriptive survey research is designed as a method for collecting information by interviewing or administering a questionnaire to a sample of individuals to collect the information on their attitudes opinions and habits (Orodho & Kombo, 2002). The study also employed qualitative and quantitative methods to analyze the data. A mixed method approach converged findings and extended the breadth of inquiry. Qualitative method was used as a tool, because of its broad approach towards understanding and explaining the meaning of social phenomenon in naturalistic setting (Marshal & Rossman, 1999). Quantitative method was employed to analyze Likert- scale data found on the survey questionnaire.

Target Population

Target population as defined by Best and Khan (1999) is the small portion of the population selected for observation and analysis. It is the population to which a researcher wants to generalize the results of a study. Based on this understanding, the target population was teachers and researchers from the 12 public schools ranging from the university to the basic schools in Ebonyi State Nigeria. Public schools were chosen for this study because they form over 90% of all schools in the state. The public schools especially the secondary were either, boarding or day. Other characteristics associated with the schools included boys only or girls only but most of the schools were mixed.

Sample Size and Sample Selection

The study adopted both probability and non-probability sampling methods. Probability sampling is the process where random selection is used to select respondents with each of them having an equal chance of being included in the sample (Singleton, 1988). In non-probability sampling, there is no way of specifying the probability of each unit inclusion in the sample and there is no assurance that every unit has some chance of being included. In this method, a desired number of sample units are selected deliberately or purposively, depending

upon the objective of inquiry so that only the important items representing the true characteristics of the population are included in the sample (Nachmias & Nachmias, 1996). Convenient sampling was used in selecting the 12 public schools out of 174 public schools and four private schools which have been classified into tertiary, secondary, and basic schools (see Table 1 below). The enrollment of teachers in the state was 1,378. Out of this number, 200 of them were sampled randomly from the three levels of schools but 150 which represent 75% were received after the questionnaire administration from the 12 sampled schools. Purposive sampling technique was used to sample the schools into three main categories, that is: boys only, girls only, and mixed schools. This was crucial in order to establish whether the category of the school was significant to the research questions. Simple random sampling was used to select the teachers from the three levels of schools in the Ebonyi State as mentioned above.

Table 1

Showing the Sampling Size of the Target Population

Levels and characteristics of schools	Total number of schools in the state	Total number of sample schools
Tertiary: Mixed boys only	3	2
Secondary (mixed and girl only)	4	3
Basic mixed	167	7
Total	174	12

Research Instruments

The instrument used for the study was questionnaire. It was prepared for teachers who perform dual functions in the school settings (that is those in classroom and administrative setting). A questionnaire is a carefully designed instruction for collecting data direct from the people (Kasomo, 2006). It has an advantage of achieving rapid contact with a large number of people (Krathwohl, 1998). It was divided into three parts namely Part 1, Part 2, and Part 3. Part 1 consist of questions aimed at obtaining information on the profile of the teacher (i.e. Biodata), Part 2 also consist of questions aimed at getting information on ergonomic in the teaching profession and finally, the Part 3 was sub-divided into four sections labeled A, B, C, D. These sections consisted of questions aimed at getting information on occupational safety, occupational health, and occupational environment of teachers respectively. The researchers used questionnaires which consist of both open-ended/unstructured and closed-ended/structured questions. Contingency questions and matrix questions were also used. The aim of using the open-ended questions was for the researcher to allow respondents to freely discuss issues without limiting the score. The close ended questions were utilized because they are quicker and easier to complete therefore touching on a wider range of information. The contingency questions were used because follow-up questions were needed to get further information. Matrix questions were used to get information from questions which share the same set of responses.

Validation of the Instrument

According to Borg and Gall (1998, validity is defined as the degree to which a test measures what it purports to measure. Mugenda and Mugenda (1999) also define it as the accuracy or meaningfulness of inferences which are based on research results. To ensure the validity of the questionnaire, the researcher collected the data, a pre-test was conducted using the various principals from the tertiary institutions, principals from the secondary schools; the researcher sampled since they were not used as part of target group and their experiences they have had due to their long services in the profession as teachers and now principals and headmasters of their institutions.

This helped to check the appropriateness of the language used in constructing each item, and construct validity and content validity of the questionnaire.

Data Collection Procedures

The data was collected from 200 teachers from the sampled schools using self-administered questionnaires. According to Kotler (1998), the advantage of using self-administered questionnaire is to ensure the respondents privacy. In this sense, the researcher dropped the questionnaires personally to keep such level of confidentiality. This is important as it helped the researchers establish a rapport with respondents while introducing the survey. The researchers used pick and dropped approach (i.e. where the researchers submit the questionnaire to the respondents and return for the questionnaires after it has being answered within the stipulated period). Some of the questions were responded instantly and the researchers collected them back on that same today. However, to some respondents, one week was given to them to respond to the questions after which the researcher picked them. This was done to allow respondents to have enough time to respond positively to the questions.

Data Analysis Procedures

Kerlinger (1998) defines data analysis as the process of categorizing, manipulating, and summarizing data in order to obtain answers to research questions; once data was collected, it was edited by carefully inspecting it in order to identify the mistakes and any wrongly answered and not responded to items, and it was then coded. The quantitative data was analyzed using descriptive statistics to describe, summarize, and explain or make sense of a given data.

Data were analyzed using descriptive statistics. Following data collection, responses were edited to identify errors, incomplete items, and inconsistencies, then coded for analysis. Frequencies and percentages were computed for all questionnaire items to describe the distribution of responses across demographic variables, ergonomic conditions, occupational safety measures, and health-related indicators. Results are presented in tabular format. The Statistical Package for Social Sciences (SPSS) version 16 was used for data processing and analysis. Qualitative data from open-ended questions were analyzed thematically and presented in prose.

Results

Introduction

Researchers present the results of the data collected and further discuss the findings. Descriptive statistics such as frequencies and percentages were used to analyze responses to various questionnaire items.

Response Rate

A total of 200 questionnaires were issued to the respondents from the sampled schools. One hundred and fifty out of 200 questionnaires given were answered. The analysis was therefore done using the 150 questionnaires received from the respondents. The results are presented as shown below.

Table 2

Return Rate of the Questionnaire Administered

Variables	Frequency	Percentage (%)
Response	150	75%
Non-response	50	25%
Total	200	100

The researchers targeted 200 respondents with 150 respondents answering the questionnaires which constituted 75% and the remaining 50 respondents constituted 25% of which the questionnaires were either not answered or had been displaced by respondents

Demographic Information

The following information was sought from the respondents on their occupation: gender, category of schools, qualified teachers in the sample schools, level of professional training, teaching experience and responsibilities, the respondents have in their school besides classroom teaching. Table 3 indicates gender distribution of the teachers interviewed.

Table 3

Respondents Gender

Gender	Frequency	Percentage (%)
Male	104	69.3
Female	46	30.7
Total	150	100.0

The teaching as an occupation has become competitive among genders and the study conducted in state on teachers from Table 3 indicates that 69.3% were males while 30.7% were also females. When you critically observe the table well, there was a significant difference between gender in the responses; the male teachers were twice more than female teachers because the promotion of girl child education in the municipality is low, and Ebonyi State Ministry of Education service branches in Abakaliki do not often post female teachers to the various rural schools. This research is in line with Abakisi's (2009) findings when he worked on the employment satisfaction of teachers in Junior High School in Afikpo education zone which unveiled that the male teachers dominated females with 64% of males and 36% of females.

Table 4

Category of Schools Where the Subjects Were Pooled to Answer Questionnaires

Categories of schools	Frequency	Percentage (%)
Basic level	76	50.7
Secondary level	48	32.0
Tertiary	26	17.3
Total	150	100.0

Table 4 shows the category of schools covered by the respondents and indicates that 51% (76) respondents were teaching at the basic level, 32% (48) respondents were teaching at the secondary level while 17% (26) respondents were teaching at tertiary level. This shows that majority of the respondents were from the basic level due to the large number of basic schools that are found in the Abakaliki Municipality.

Qualified Teachers (Train and Untrained)

Table 5

Trained and Untrained Teachers in the Sample Schools

Qualify teachers	Frequency	Percentage (%)
Trained	132	88.0
Untrained	18	12.0
Total	150	100.0

Professional training is critical in education, as it directly influences teachers' pedagogical effectiveness. Training is a way of guiding, educating, and instructing one to keep up to the demand of his or her master. In view of this, Table 5 shows that teachers trained are represented by 88% and those that are untrained constitute 12%. Information on trained and untrained teachers was sought because the systematic and logical nature of delivery of lesson is found to be paramount in teaching profession to bring out the total change in the students or pupils in the schools. The analysis shows that trained teachers substantially outnumber untrained ones. This means that the level of competence in performance of teacher and systematic delivery of lessons to the pupils or students in various schools ranged from primary to tertiary in the municipality.

Table 6

Professional Qualification of Train Teachers

Professional qualification	Frequency	Percentage
A certificate, O and A level	10	6.7
Diploma in education	35	23.3
Degree in education	75	50.0
Master in education	17	11.3
Others Like BSC, BA, MSC	13	8.7
Total	150	100.0

Table 6 shows the various qualifications of the respondents who are trained and untrained and are teaching in the sampled school. From the analysis we can deduce that 87% of the respondents have been trained with 50% of teachers having degree in education, 23% of the teachers having diploma in education, 11% of them having master in education and remaining respondents were 7% and 9% for respondents with Certificate O and A level and others like Bachelor Science (BSC), Bachelor of Art (BA), Master of Science (MSC). The information on professional training was sought to monitor the kind of qualifications; the teachers who are teaching and lecturing in the sampled schools have and verify whether they really qualify to be working at their stations and from the analysis it shows that the teachers qualified to teach at the various schools.

Table 7

Teaching Duration of the Subject Teachers Encountered During the Survey

Years of teaching	Frequency	Percentage (%)
Less than 1 year	22	14.7
1-5 years	47	31.3
6-10 years	31	20.7
11-15 years	21	14.0
16-20 years	17	11.3
Above 20 years	12	8.0
Total	150	100.0

From Table 7, the findings indicate that teachers had varied teaching experience, 31% had teaching experience of between 1 to 5 years, 21% had teaching experience of 6 to 10 years, 15% had teaching experience below 1 year, 14% had the experience of 11 to 15 years; teachers who had teaching experience of 16 to 20 years recorded 11% while 8% had teaching experience above 20 years. This implies that 53% of the respondents had experience of more than 5 years which translate to a good performance, building on the premise that performance improves with experience.

Respondents Subjects' Distribution

The distribution of teachers according to the subjects' groups is shown on Table 8 below.

Table 8

Respondents Subjects' Distribution

Subject distribution to respondents	Frequency	Percentage (%)
Sciences	60	40
Technical applied	24	16
Humanities	16	10.7
All subjects	29	19.3
Languages	21	14.0
Total	150	100.0

The finding from Table 8 above indicates that 60 teachers (40%) taught science subjects which include biology, chemistry, and physics and other related science courses that were taught in the tertiary institutions namely history, entomology, and crop science, 29 teachers (19%) were teaching all subjects, 24 teachers (16%) taught technical applied subjects namely technical skill, information communication technology (ICT), home science, agricultures, 21 teachers (14%) taught languages namely English, Twi, Hausa while 16 teachers (11%) taught humanities subjects namely geography, history, social studies, Christian religious studies (CRS). This indicates that all the subjects taught in various levels of schools are fairly represented in the sample. This would enable relevant information to be obtained as different subjects expose teachers to different occupational risks and hazards differently.

Table 9

Respondents Responsibilities (Position Held in School) Besides Teaching in the Classroom

Positions	Frequency	Percentage (%)
Administrator	2	1.3
Registrar	1	0.7
Exam officer	15	10.0
Dean of students	2	1.3
Headmaster/headmistress	8	5.3
Head of department	20	13.3
Sports/master/mistress	17	11.3
Other positions (form master, academic counselers, welfare, GNAT official, etc.)	85	56.7
Total	150	100.0

To check the other responsibilities of teachers apart from the normal teaching done in the classroom, the findings from Table 9 indicate that, 57% respondents were having or holding other responsibilities or positions such as form masters, academic counselors, welfare and GNAT official in the school as teachers, 13% respondents were head of department, 11% respondents were sport masters and mistresses, 10% respondents were exam officers while 5%, 1%, 1%, and 1% were respondents who were teachers and the same time as headmaster/headmistress, dean of students, administrators, and registrar respectively. This information was sought to investigate whether there were other responsibilities that teachers perform aside their teaching and also monitor how they combine the respective duties in the school to ensure efficient and effective teaching and

learning. From Table 9 it proves that teachers perform different duties part from the already known duties in schools as subjects of academic delivery.

Ergonomic Safety

This section presents data of findings on the ergonomic materials that are used by teachers in their schools. These encompass the comfortability of the furniture the teacher used in various offices and classroom, teaching aid, means of ventilation, nature of light in the classroom and offices, working exposure and computers used by teacher in teaching or lecturing.

Table 10

The Comfort of Office and Classroom Furniture (Chairs and Tables) Used by Teachers

Variables	Frequency	Percentage (%)
Yes	36	24.0
No	114	76.0
Total	150	100.0

Ergonomic comfort is essential for maintaining workers' physical health and preventing musculoskeletal disorders. From the data on Table 10 above, it indicates that 76% (114) of the teachers said “No” which means they were uncomfortable about the furniture they used in their work while 24% (36) of the teachers responded “yes” in the affirmative that their level of comfort actually depends on the quality of the furniture they use for either storing of books or sitting when marking exercises or for relaxation in the school. The information was sought to cross examine whether the furniture the teachers use has some associated adverse health effects on them and from the analysis it indicates clearly that more than twice of the teachers expressed their discomfort about the furniture when using them and have had certain health complications such as backaches. It could be that the design of the furniture did not favour the teacher’s height (i.e. be it longer and shorter). This research is in line with Beach (2005) from findings which affirmed that furniture used by teachers has reflected many impacts on their health in schools.

Table 11

Teaching Aids Used by Teachers in School

Teaching aids	Frequency	Percentage (%)
Chalk	92	62.0
Marker	57	38.0
Total	150	100.0

From Table 11 the data there indicates that 62% (92) of the respondents were using chalk for teaching in the classrooms while 38% (57) of them depended on markers when teaching in the respective classroom. From the study the researcher realized that most of the basic and few secondary schools teachers were using chalk and tertiary schools mostly used the markers. The information was sought to investigate teacher’s level of comfort in the aids that they used in teaching. We could deduce that the majority (62%) of the teachers who used chalk complained so much about the health problems they had since they started using it and being soiled everyday by dust particles of the chalk.

Table 12

Ventilated Materials Used in Schools

Ventilated materials	Frequency	Percent
Windows, glass louvers and doors opened intermittently	119	79.3
Fan	18	12.0
Air condition	6	4.0
Others	7	4.7
Total	150	100.0

Table 12 shows the means of ventilation at the various offices and classrooms in the sampled schools in municipality. It is clear form above that the main source of most ventilation in the schools were windows, glass louvers, and doors which could be opened intermittently and represents 79% which constituted 119 respondents, 12% (18) respondents use fans in the classrooms and offices while 5% (7) depended on others source such as like block moldings while 4% (6) of the respondents were using air conditioners in their offices. From the research, it was deduced that almost all the tertiary schools like the University and Colleges of Education were using fans in the classrooms and air conditions were used in some of the offices of the lecturers. It could be concluded from the above that in terms of modernized ventilation, the tertiary schools in the municipality were better than those at the basic and secondary levels.

Table 13

Nature of Light in Offices and Classroom in Schools

Nature of light in classroom and offices	Frequency	Percentage (%)
Normal brightness	121	80.7
Brighter than expected	4	2.7
Dim	7	4.6
Do not have all	18	12.0
Total	150	100.0

Table 13 shows the nature of light in the classrooms and offices of the teachers in the schools and it indicated that 81% (121) of the respondents expressed that the light in the classroom and offices had normal brightness, 12% (18) had no access to electricity in their school while 5% (7) depended on dimlights in classroom while 3% (4) of the subject were utilizing brighter lighting system. This information was sought to check the glare of the light used in the classrooms and offices of the teachers since light could also have detrimental effect on the health of the teachers when it becomes dim and brighter than expected in the classroom. From the analysis, it could be concluded that light used in the classrooms is normal and may not bring any health complications to teachers if it is uninterruptedly available

Table 14

Working Exposure of Respondents

Indicative response factor	Frequency	Percentage (%)
Standing when teaching or lecturing	129	86.0
Sitting when teaching or lecturing	2	1.3
Standing, sitting and writing on board when teaching	19	12.7
Total	150	100.0

The kind of postures workers undertake to discharge his duties is important and even determines how productive the worker will be in the working environment. Therefore, this information was sought to survey the working posture of the teachers and researchers in the schools. From Table 14 the data shows that 86% (129) teachers teach or lecture while standing, 13% (19) teachers also teach while standing and writing on the board in the course of delivery of lessons, sitting while marking or relaxing during break hours and even sitting during delivering hours. Only 1% of teachers sit when teaching or lecturing in the classroom and lecture halls. From the analysis, there may be certain potential health risks to teachers since standing postures are associated with greater pelvic tilt and lumbar lordosis (De-varlho, 2010). This clearly show that most teachers stand while teaching in the classrooms.

Table 15

Laboratory Presents in the Schools of the Respondents

Variables	Frequency	Percentage (%)
Yes	61	40.7
No	89	59.3
Total	150	100.0

The purpose of the laboratory in schools is to bring abstract sciences into practical setting for the understanding of students. In view of this, Table 15 shows the number of laboratories available for the respondent's work. About 89 teachers representing 59% said no which means that their schools were not having it in place while 61 teachers representing 41% yes which also indicates that they have it in place. From the analysis, we can say that the study of science in our schools is not as effective as wanted because the schools do have needed facilities to practicalzed the subject for the understanding of the students. Even the 41% of teachers were having laboratories in their schools; about 39% of them practiced proper laboratory safety cautions which means they have some of personal protective clothing in place which protect some of the students when they attend their practical lessons in the laboratory. Since we have less than half of the laboratories having the personal protective clothing in place, the students will be exposed to many health risks that could either be through inhalation or skin contacts.

Table 16

Respondents That Use Computers in Teaching

Variables	Frequency	Percentages (%)
Yes	40	26.7
No	110	73.3
Total	150	100.0

Presentation of lessons in the classroom takes different format which includes the use of PowerPoint which normally goes with the use of computer in the classroom. In view of this, Table 16 shows teachers who were using computers (laptops) when teaching and 100 teachers representing 73% responded "No" while 40 teachers representing 27% responded yes which means they use computers in teaching. The information was sought to check whether they have some protective covers at screens of the computers the individual teachers used and those that were found in the computer labs of the schools in the municipality. From the study, it was observed that even the 27% of teachers who were using computers were not having the screen filters and other protective gadgets in place.

Occupational Safety

This section presents data on teachers' level of agreement on implementation of occupational safety in their schools.

Table 17

Teachers Level of Agreement on the Safety of School Structures in Schools

Response	Frequency	Percentage (%)
Strongly disagree	18	12.0
Disagree	19	12.7
Neutral	22	14.7
Agree	62	41.3
Strongly agree	29	19.3
Total	150	100.0

The findings from Table 17 indicate that 37 (25%) teachers disagreed that their school buildings were safe enough to work in. 22 (15%) teachers were neutral while 91 (60%) of the teachers agreed the buildings were safe and secure and therefore did not hinder their performance and do not threaten them when they are teaching in the various classrooms. Safe structures /buildings promote use of skills by teachers since they do not hinder anything a teacher may wish to do to ensure effective lesson delivery such as displaying charts on the wall.

Fire Safety Measures

Table 18

Shows Teachers' Level of Agreement on Availability of Fire Extinguishers in Schools

Response	Frequency	Percentage (%)
Strongly disagree	85	56.7
Disagree	39	26.0
Neutral	13	8.7
Agree	9	6.0
Strongly agree	4	2.7
Total	150	100.0

The data on Table 18 reveals that 124 (83%) teachers disagreed that their school had fire extinguishers that are in perfect working conditions to use in case of fire outbreak. 13 (9%) teachers were neutral and 4 (3%) teachers agreed they had fire extinguishers that are in working state. Majority of teachers therefore confirmed their schools do not have firefighting preparedness. Having such preparedness is a control measure for fire hazards. Fire accidents lead to injuries that hinder teachers' mental and physical skills. This may also cause the stationary of the teachers used for references burnt up, which may affect them psychologically.

Firefighting Training and Techniques

Table 19

Teachers Level of Agreement on Firefighting Training as Needful Exercise

Response	Frequency	Percentage (%)
Strongly disagree	103	68.7
Disagree	32	21.3
Neutral	15	10.0
Agree	0	
Strongly agree	0	
Total	150	100.0

The data from Table 19 indicates that 135 (90%) of the teachers disagreed on having received firefighting training and techniques since their appointed before the survey. 9 (6%) teachers were neutral. This shows that teachers are not aware of what to do in case of fire incidence either in class or in the offices. Science teachers, whose work in the laboratory puts them at a higher risk of fire hazards were indeed concerned about this, one of whom commented that "I avoid performing some experiments for fear of fire outbreak, and instead emphasized the claim on basis of theoretical explanations" a factor that he attributes to poor performance of questions set from that particular area of the curriculum.

The Availability of Emergency Doors

Table 20

Teachers Level of Agreement on Availability of Emergency Doors in Offices and Laboratories

Response	Frequency	Percentage (%)
Strongly disagree	63	42.0
Disagree	27	18.0
Neutral	15	10.0
Agree	26	17.3
Strongly agree	19	12.7
Total	150	100.0

From Table 20 the findings indicate that 60% of the respondents disagreed with the view on having emergency doors in their offices and laboratories, 10% were neutral, while 29% agreed. Those in agreement however, specified that, such doors did not open from outside. This poses a great danger of trapping victims inside a room in case there is fire, as there is always a tendency to crowd behind the door in attempt to escape. They also reported most of the windows have been covered with metal nets which makes it impossible for them to escape in case of fire outbreak in the classroom and offices.

Safety From Slips and Fall

Table 21

Use of Precautionary Measures Against Slips and Falls in Their Schools

Response	Frequency	Percentage (%)
Strongly disagree	11	7.3
Disagree	14	9.3
Neutral	21	14.0
Agree	60	40.0
Strongly agree	44	29.3
Total	150	100.0

The results above indicate that 17% of teachers felt that the floors of their offices and the classrooms including the staircases are not kept dry enough to avoid slips and falls, 14% were neutral while 69% were in agreement that indeed precautions are taken to protect them from slips and falls in their schools. The respondents admitted that the floors and staircase were kept dry all the time so most of the teachers avoided slips and falls in the various classroom and offices. These findings established are in line with the findings of the British health and safety executive that slips and falls lead to injuries, cuts, and abrasions which lead to absenteeism of workers.

Influence of Occupational Health on Teachers Performance

The study further investigated whether occupational health hazards have any influence on public school teachers' performance of duties in the survey. This section presents data on teachers' responses on occupational health in their respective schools, and the influence these have on the performance of their duties.

Table 22

Analyses on the Number of Teachers Trained on Health Issues

Response	Frequency	Percentage (%)
Yes	57	38.0
No	93	62.0
Total	150	100.0

Table 22 reveals that 62% of the interviewed teachers had not been trained on any health issues; 38% had been trained, most of whom on general health issues which include (sex education and sanitation related diseases) and the current pandemic disease HIV/AIDS and Hepatitis. The findings of the study are that most of the respondents had little information on health hazards related to their work. This implied that most of the teachers were in danger of passive exposure to work related health hazards.

Table 23

Analyses on the Number of Teachers Who Have Received Vaccination

Variable	Frequency	Percentage (%)
Yes	69	46.0
No	81	54.0
Total	150	100.0

From analysis above, it indicated that 54% of the respondents had not received vaccination to protect themselves against infectious diseases; 46% of them had received vaccination against infectious diseases. This can be attributed partly to lack of strictness by the authorities in charge of recruitment section of Ebonyi State Ministry of Education in receiving such vaccination and partly due to lack of information.

Table 24

Analysis of Results on Teachers' Use of Protective Clothing When Handling Chemicals in School

Response	Frequency	Percentage (%)
Yes	14	9.3
No	106	70.7
Not applicable	30	20.0
Total	150	100.0

Table 24 reveals that 20% (30) of teachers who are required to wear protective clothing due to the subjects they teach did not wear them, only 9% (14) teachers wore such clothing while 71% (106) teachers did not. These findings reveal that majority of the teachers are in danger of being exposed to chemical hazards which include concentration of mists vapor gases, acids, and alkaline and solids especially for most sciences and other teachers in the respective schools. These are associated with voice disorders, soreness, and hoarseness which interfere with lesson delivery.

Analyses of Results on the Person in Charge of Health Emergencies in the Schools

Table 25

Teachers Responses on Handling of Emergencies in the School

Response	Frequency	Percentage (%)
School nurse	38	25.3
Colleague teacher	85	56.7
Do not know	27	18.0
Total	150	100.0

The results from the Table 25 above reveal that 25% of teachers agreed with having a school nurse to take care of health emergencies in their school; 57% of the teachers revealed that such emergencies are handled by colleague teachers, regardless of their knowledge on health problems of the patients. These findings reveal that teachers may be exposed to chemical hazards and biological hazards such as infectious diseases which can inflict them in the course of administering first aid either to students or colleague teachers since they have little knowledge on the precaution to be taken first before the treatment.

Table 26

Teachers Response on First Aid Box in the School

Response	Frequency	Percentage (%)
Yes	123	82.0
No	18	12.0
I do not know	9	6.0
Total	150	100.0

From analysis of the data on Table 26 above, it reveals that 82% (123) of the teacher have first aid box in the schools. However, most of the teachers commented that the first aid box was not well-equipped and they also commented that the boxes were stored in open places in the staff common room and which affected the efficacy of the drugs since most of them are not to be exposed to the sun and other conditions; 12% (18) of the teachers admitted having no first aid kit in their schools. Only 6% (9) of the teachers could not specify whether the school has first aid kit in place. Even most of the teachers admitted having the first aid box in their school but it was not useful to either the teachers or students in terms of sickness. Those are in charge of administering the drugs to a sick teacher or student when not available all the time there will be chaos as to whom is supposed to be performing such duties in the school.

Analyses of Results on Teachers Dining Area

Table 27

Shows the Results on Teachers Dining Area in the School Contacted

Response	Frequency	Percent
Staff common room	100	66.7
Classroom	20	13.3
Cafeteria	11	7.3
Dining area	6	4.0
Under trees	13	8.7
Total	150	100.0

From Table 27 the results reveal that, majority of the respondents 100 (67%) expressed that they take their meals in the staffroom, 20 (13%) stated other areas like classroom, 13 (9%) expressed that they take meals under trees, 11 (7%) of teachers were patronizing the school cafeteria while 6 (4%) took meals from a dining hall. These findings indicated that most schools do not have dining facilities for teachers; this poses a danger of biological hazards which include rodents, virus, bacteria which are attracted by food particles left behind especially when thorough cleaning is not done regularly. Some of respondents stated they sometime take snacks when they are in the laboratory; this does not only expose them to biological hazards but chemical hazards as well. To avoid more elaborate discussion, some variables were left unanalyzed.

Conclusion

This study confirms that teachers and researchers in Ebonyi State academic institutions face significant environmental, ergonomic, and occupational health hazards that have been systematically overlooked in educational policy and practice. The findings are consistent with previous research conducted in other developing countries (Aryal, 2007; Kuria, 2009), confirming that teachers in resource-constrained settings experience similar occupational health challenges. However, this study adds new evidence from the Nigerian context, particularly highlighting the severe deficiencies in fire safety preparedness (83% lacking fire extinguishers) and ergonomic standards (76% reporting furniture-related discomfort) in Ebonyi State schools.

Specifically, the study established that:

Physical and psychological hazards are prevalent. Teachers reported work-related stress (86%), furniture-related discomfort (76%), and persistent health issues (62%), indicating that the teaching profession carries significant occupational health risks.

The occupational environment is largely unsupportive. While lighting conditions were generally adequate, poor ventilation, acoustic hazards from overcrowding, and inadequate sanitation facilities were common across most schools.

Fire safety preparedness is critically deficient. The majority of schools lacked fire extinguishers (82%) and teachers lacked firefighting training (89%), posing serious safety risks.

Welfare facilities are inadequate. Most schools lacked proper dining facilities, rest areas, and sanitary fixtures, exposing teachers to biological and chemical hazards.

These findings suggest that occupational health in the education sector has been systematically overlooked in Nigerian policy frameworks, despite existing legal provisions under the Employee's Compensation Act of 2010. Without targeted interventions, these hazards will continue to compromise teacher well-being, job satisfaction, and ultimately, the quality of education in Ebonyi State.

Recommendations

Based on the findings of this study, the following recommendations are made to address the ergonomic and occupational health hazards affecting teachers and researchers in Ebonyi State institutions. It is against this background that the recommendations below are made:

The Ministry of Education should collaborate with ministry of health to have pre-medical screening for any teacher before he or she begins to work as a teacher.

Since the research brought out some work-related ailments about teaching, the government and policy makers should integrate it into the existing policies about government workers so that incentive should also be

given to teachers and researchers in our institutions.

Designers of furniture used by teachers and researchers in classrooms and offices to discharge their duties should be made considering all sizes, height, and weight of users before distributing them to the various schools.

Teachers should report any problem they encounter that emanate from the teaching to the appropriate authority for them to be aware that there are some health risks associated with the teaching profession.

With regard to occupational health, it is recommended that teachers wear protective clothing's when handling chemicals to avoid ailments related to such exposures. The schools should ensure that there are facilities for rest and eating meals for teachers, as this will ensure reduction in exposure to both chemical and biological hazards.

There is the need to provide a good occupational environment for teachers by ensuring unnecessary noise is controlled in and around the school buildings. Such buildings should also be well ventilated, and proper housekeeping maintained. Proper records regarding accidents and injuries sustained and suffered by teachers, and their causes should be kept in schools to provide information to teachers, as well as serving as measures to control reoccurrence of similar incidences.

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