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were adversely a ected by the exposure to formaldehyde and exhibited some clinical symptoms such as respiratory distress. Pre-clinical students handle these cadavers mostly and so this study will seek to know how much knowledge that pre-clinical students at Copper belt University School of Medicine have on use of xatives such as formalin in embalming and the e ects of high exposure and the precautions taken while in the cadaver room.

Specific objectives

- To nd out if the preclinical students take safety precautions whilst in the cadaver room
- To assess whether preclinical students are taught or oriented about cadavers' embalming uids before they begin dissecting
- To assess preclinical students' knowledge on the short- and long-term e ects of formaldehyde.

Research questions

1. Do students who are oriented take more precautions while handling cadavers compared to those who were not oriented
2. Does gender have a role to play in the precautions taken in the cadaver room? Are the female students more cautious than the male students
3. Does an increase in age make the student more cautious?
4. Does been knowledgeable about the short and long term e ects of formalin toxicity make the students take better precautions when handling the cadavers compared to the less knowledgeable

Measurement

is research had ve variables of which some were independent while the some were dependent. e variables were orientation, knowledge, precautions, age and gender.

Orientation in this study is de ned as familiarization of the cadaver room.it also includes a discussion on formalin, its e ects (both short and long term) and precautions to taken to reduce toxicity. Orientation was an independent variable.

Knowledge of the acute and chronic e ects of formalin toxicity was a dependent variable. It was de ned as facts and information that could have been acquired through experience or skill. It was measured as follows; those who scored 0-10 were considered to have poor knowledge, 11-16 had average knowledge and nally 17-21 were considered to be knowledgeable. Knowledge of the short and long e ects of formalin toxicity was dependent on orientation before beginning cadaver dissections.

Precautions were de ned as a measure taken in advance to prevent the e ects of formalin toxicity. It was a dependent variable which could be a ected by knowledge, age, gender and orientation. Total precautions were scored as follows; 0-5 did not take proper precautions (i.e. poor) while 5-7 took average precautions. Lastly those who scored 8-10 were considered to be cautious.

Gender which is the state of been male or female was an independent variable.

Age of the respondents was an independent variable which was divided into the following ranges; 20-25, 26-30 and > 30 years. (Figure 1)

Methodology

Background on study area

e Copperbelt University is located in the Copperbelt province of Zambia. It is situated in riverside in Kitwe. It constitutes of 7 schools of which the school of medicine is included. e school of medicine is located in Ndola and has 4 programs which include MBChB, dental surgery, biomedical science and clinical medicine. e total number of registered undergraduate students at the school of medicine is 1,037. e students are divided into preclinical and clinical students. e preclinical students are 581 and they are further divided in 2nd years (327) and 3rd years (254).

Target population

ird year preclinical students as they were the only class performing cadaver dissections at the time of data collection

Study design

is study utilized cross-sectional type of study design and will be conducted for a period of 5 months

Sample size

e following formula was used in comparison to epi.info so ware to determine the sample size.

Information needed for determination of sample size included

Level of conýdence measure (Z)	1.96 (at 95% conýdence level)
Margin error (e2)	5%
Prevalence	50% (as no estimates exist)

e sample population of 254 was used to determine the sample size using the stat calc programme of Epi info version 7.0 with the expected frequency being 50% con dence level being 95% or 1.96 and 5% margin of error, a sample of 154 students was calculated (which was the number of students assessed).

Sampling procedure

Systematic random sampling was used in this study as it reduced biasness.

Inclusion criteria

e study will involve collection of data from third years that consent to participate

Exclusion criteria

Clinical students and biomedical students as they do not perform cadaver dissections. Second years as were not performing cadaver dissection at the time of data collection. ird year students who refuse to consent will be excluded from this study.

Data collection

e data was collected by the principle investigator through questionnaires administered to the participants upon receipt of a formal consent. The principal investigator was available while the respondents were answering the questionnaires and this was to explain any questions the respondents did not understand. The questionnaires were in English as all the participants understood English well.

Data analysis

e data was analyzed using SPSS version 21.

Ethical consideration

Results obtained from this study were strictly con dential and only relevant authorities had access to this information. It should also be noted that there was no direct link to participants as the principle of con dentiality was observed. e participants took part in this study voluntarily and before they took part an informed consent was taken. With this autonomy was respected.

Limitations

is study was limited to third preclinical medical students at the Copper belt University School of Medicine, Ndola

Results

Demographics

e total number of students that were accessed was 154 however 9 students didn't return the questionnaires hence making the total number of students assessed 145. All the students assessed were third year students at the Copperbelt university school of medicine. e students were a mixture of MBChB, Bachelor of dental surgery and clinical medicine programs. Out of the students assessed, 66.2% were male while 33.8% were female. e majority of the student ages ranged from 20-25(90.3%) while the rest were 26- 30(7.6%) and > 30(2.1%). Table 1

Safety precautions in the cadaver room

75.2% of the students took average precautions in the dissection room while only 2.8% were very cautious as shown by the bar chart (Figure 2).

On further analysis, as shown in Table 2 below, 97.9% of the participants agreed to have taken general precautions in the dissection room. Some of the precautions taken where wearing laboratory coats (94.5%) gloves (99.3%) face masks (25.5%) washing hands a er handling cadavers (89%). Furthermore 86.9% agreed to opening windows during dissections and 33.8% agreed to opening only the part to be dissected during dissections. e least percentages where participants who wore face goggles (0.7%), aprons (2.1%) during dissections and periodically removed uid dripping in the body trays (7.6%) (Table 2).

Orientation of respondents

e bar chart in gure 3 shows the frequency and percentage of respondents responding to the whether they were oriented or not before beginning cadaver dissections. 33.1% agreed to have been oriented before they started cadaver dissections while 69.9% responded that they were not oriented (Figure 3).

Knowledge of formalin and its effects

e bar chart in gure 4 shows the frequency and percentage on how respondents scored on the knowledge of formalin and it e ects (acute and chronic). 63.4% had poor knowledge while 34.5% of the respondents had average knowledge. ose who were knowledge were only 2.1% (Figure 4) (Table 3).

From the table above 82.1% know the chemical used in embalming/ xation, 40.7% had knowledge of the short and long term e ects of formalin. 84.8% knew unpleasant smell as an e ect of formalin while 72.4% reported to know itching eyes as an e ect. e other e ects were which the respondents knew were headaches (39.3%), asthma trigger

Participants who took precautions in the cadaver room	142	97.9
Participants who wore gloves when handling cadavers	144	99.3
Participants who wore face masks when handling cadavers	37	25.5
Participants who wore aprons when handling cadavers	3	2.1
Participants who wore laboratory coats when handling cadavers	137	94.5
Participants who wore face goggles when handling cadavers	1	0.7
Participants who washed their hands after handling cadavers	129	89
Participants who opened windows/doors during dissections	126	86.9
Participants who opened only the part to be dissected	49	33.8
Participants who periodically removed the fluid dripping in the body trays	11	7.6

respondents took average precautions compared to 69.07% who were not. is means that orientation of the students before beginning cadaver dissections would make them more cautious and therefore reducing the exposure and e ects of formalin.

During their medical practice, medical students are exposed to formaldehyde via the specimens they dissect. (Neginhal et al,) Formaldehyde which is present in formalin has toxic e ects which can a ect the health of medical students. To prevent such e ects, proper precautions should be taken to prevent toxicity (Patil et al,). In this study, 75.2% scored average on the precautions they took in the dissection room. 99.3% reported wearing gloves and 94.5% reported to have worn laboratory coats during the dissections in comparison with students from Alexandria faculty of medicine where 73.1% wore gloves and 78.1 wore laboratory coats (Elshaer and Mahmoud). is is also in agreement with Nigerian medical students were 78% wore gloves and 86% wore laboratory coats to reduce toxic e ects of formalin(Dixit et al,) On the other hand 0.7% of the students in the current study

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