# Assessment of Competency and Biosafety in Mortuary Science Practice Among Practicing Morticians in Western Kenya

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## ABSTRACT

*Human bodies are fundamental specimens used in medical education. They are widely used and indispensable in the training of medical and allied students, practicing morticians, and in biomedical research. However, contradictions abound in the use and exchange of human tissue. Human bodies are generally understood to carry moral worth and command respect, consideration, and care. Still, they are nonetheless transformed into commodities by institutional practices that depend on a steady supply of human tissue. The objective of the study was to assess the Competency and Biosafety in Mortuary Science Practice among practicing morticians in Western Kenya. Specifically: to evaluate the level of bio-safety skills among practicing morticians, determine the competencies required of practicing morticians, and determine factors associated with competency and biosafety skills among practicing morticians in Western Kenya. This study was guided by the Context Input Process Product [CIPP] evaluation model. A cross-sectional design was used where qualitative and quantitative data was collected. The target population was trained practicing morticians in the Western region of Kenya. The sample size was determined using Yamane's formula, yielding a sample size of 89 out of 102 study subjects. A semi-structured questionnaire was used, with purposive sampling strategy applied to get practicing morticians in Western Kenya. Data was analyzed using SPSS software version 28, and the findings have been presented in the form of tables, graphs, and charts. The most undertaken training was the use of Personal Protective Equipment (n=348, 97.80%). Training in handling of sharps and waste at n=23 (1.1% and 2.2%, respectively) were the lowest score outcomes. Most of the respondents reported always (47%) applying their biosafety skills in their practice. Overall, 82% demonstrated a high level of proficiency in biosafety skills. Most were highly proficient at technical skills (58.40%), ethical skills (86.50%), and 82% had a high proficiency in business management. The overall competence level was determined as respondents with a high proficiency level in at least three of the four measured skills. 71.9% of the practicing morticians were found to be competent. County and facility type influenced competence. Practicing morticians in Kakamega County were 69% less likely to be competent compared to those in Vihiga County. Practicing morticians in public facilities were 2.13 times more likely to be competent compared to those in missionary facilities in Western Kenya. Personal demographic factors were not influential in determining competence. In conclusion, there was a high level of proficiency in biosafety skills at 82%, with a high level of competency among practicing morticians in Western Kenya at 71.90%. Facility type had an influence on competency, with practicing morticians in public facilities being 2.13 times more likely to be competent compared to those in missionary facilities in Western Kenya. Therefore, continuous training in biosafety skills in practicing morticians should be encouraged, competency-based training in practicing morticians should be fostered, and mortuary facilities should be equipped with necessary resources.*

**Keywords:** Assessment, Biosafety, Competency, Mortuary, Science, Practice, Practicing Morticians, Western, Kenya

## I. INTRODUCTION

A mortician is person who prepares the deceased body for cremation or burial and provide support to the grieving family (Brémaud, 2011). Globally mortician training involves combination of practical experience, ongoing professional development and formal education. Most countries offer formal programs in the field of mortuary science and practice (Ennis, 2015).The programs are usually hosted in specialized institutions, universities, colleges and technical schools. Many countries usually issue licenses for mortician which usually involves completing an accredited education program as per regulatory bodies require (Marsh et al., 2018).

In almost all the hospitals the mortuary is the most neglected and ignored place; lacking even basic facilities for the departed souls, public and officials working there. There is enormous risk working in a mortuary (Mittal et al., 2019). That is why skills and knowledge play a vital role in the field of mortuary science and practice, as they help reduce the risk of errors or mishandling of deceased individuals, thereby decreasing the number of legal suits related to ethics and professional conduct among practicing morticians (Emery et al., 2022).

In recent years, competency training has become the dominant curriculum model which has been used, because it advocates progression through training to demonstrate ability to do certain tasks. The main advantage is in terms of apparent measurable flexibility and accountability and for assessors the promise of competence based assessment in the work place which was provide an objective and reliable measurement of trainee's performance (Dumahasi, 2020).

Assessment of skills and knowledge helps encourage practicing morticians to engage in lifelong learning and continuous improvement of competences required in the field of mortuary science and practice (Bundi, 2016). Due to increased mortality rate in Kenya, there has been an increase in establishment of mortuaries and funeral homes, hence the need of professionals in the field of mortuary science. Lack of structured formal education among mortuary attendants exposes them to occupational hazards and leads to poor service delivery (Sanchez et al., 2011)

With the transition into a global village, the possibility of bio-safety and biosecurity breaches has significantly increased. The COVID-19 pandemic is an example of an in-fragment on biosecurity that has posed a serious threat to the world (Alishaq et al., 2021). Public trust and opinion are important in the field of mortuary science which enhances confidence to the public from the mortician and this can only be achieved through continuous practice of the code of ethics in the mortuaries and funeral homes (Korai & Souiden, 2017). Due to the existing gap in mortician training, the current study aimed to assess the effect of such training on the practice of mortuary science and to identify the essential competencies required for practicing morticians seeking training in mortuary science and practice in Western Kenya.

### 1.1 Statement of the Problem

Globally morticians offer important healthcare as they prepare diseased body to prevent decay(Sara Snare, 2020). Mortuaries usually play a vital role in the hospital care and processing of the deceased but are not recognized often (Woodthorpe & Komaromy, 2013). In Qatar workers who work in cemetery and mortuary may be exposed to infection of SARS-COV-2 from bodies due to community exposure (Alishaq et al., 2021).In African, mortuary service has changed perception of people regarding to funerals and death, family of the deceased are given enough time to bury their loved ones.

Countries In sub-Saharan have mortuaries which were build earlier and are no longer compatible with safety and current occupational health standard (Akinyemi et al., 2021). In Ghana among the Akan clan, when one dies a bad death, it's associated with brief, customary rites are avoided and the deceased is expunged from his lineage history (Adinkrah, 2022). According to Ajileye et al. (2018) morticians in Ghana preserve the deceased but lacked formal structured education that leads to poor occupation hazards and service delivery.

In South West Uganda mortuaries have inadequate human resource and lack proper equipment in the mortuary (Bajjou et al., 2020). Mortuary attendant are negatively affected by long term exposure to formalin, which leads to health issues which can may be reduced through surveillance, protective equipment and training (Akortiakumah et al., 2022). In Kenya mortuary science and practice is in critical need of establishing standardized and comprehensive competencies thus a need to develop a training program in mortuary science and practice (Wilson, 2015). Currently, there is a lack of proper competencies and educational guidelines leading to inconsistencies in training thus compromising the quality of mortuary services in the country (Bundi, 2016). This gap poses significant challenges, including variation in knowledge, ability, and skill levels of graduates, a lack of clear career pathways, and potential public health risks for aspiring morticians.

### 1.2 Research Objectives

i. To assess the level of bio-safety skills implementation among practicing morticians in selected mortuaries in western Kenya.
ii. To determine the competencies required for practicing morticians in western Kenya.
iii. To determine the factors associated with competency and biosafety skills among practicing morticians in selected mortuaries in western Kenya.

## II. LITERATURE REVIEW

### 2.1 Theoretical Review

The Context Input Process Product (CIPP) evaluation model is suggested as a framework for methodically guiding mortuary science and practice idea, design, execution, and evaluation, as well as providing insights and judgments on the biosafety and competency for ongoing improvement. The CIPP evaluation approach has been used to

evaluate several educational programs and entities in educational contexts(Sopha & Nanni, 2019). The CIPP evaluation technique emphasizes "learning-by-doing" to identify and correct problematic learning features. Practical application of the model can help with decision-making and quality assurance of the mortuary science program.

This model has a comprehensive approach to evaluation and can be applied from planning to outcomes and fulfilment of core values. In addition, the model is easy to apply and there is available literature on its application. Furthermore, the model covers all the stages of reviewing an educational program. It provides the information needed to bring about constructive improvement in mortuary science program. However, some drawbacks of CIPP model is that information coverage only focuses on the decision makers and it's not widely known and applied in performance improvement.

The model was chosen based on the notion that the quality of inputs processed (applied) within a specific physical and psychosocial learning environment influences the output quality of a given process. Clinical competence is measured in this scenario because clinical performance is the result or outcome of mortuary science teaching.

## 2.2 Empirical Review

### 2.2.1 Level of Biosafety Skills among Practicing Morticians

In Ibadan, Oya State morticians perceived safe handling of corpse's disinfection, restoration and preservation to be important for human remains(Akinyemi et al., 2021). Safe autopsy practices and universal precautions were important especially during covid-19 pandemic to prevent infections during post-mortem examinations (Shaha et al., 2013). The sensitive method for natural cause of death in adults, include biopsies and minimal invasive autopsies(Blokker et al., 2016). Use of bio-contained systems and N-95 particulate respirators should be worn with autopsy prosecutor's when handling blood fluid samples from HSF patients due to the aerosols generated may cause serious risk of infection (Nolte et al., 1996).

### 2.2.2 Competency Required for Practicing Morticians

Morticians require a set of competencies to enable them carry out their duties efficiently and effectively. The competencies required are legal, ethical, technical, interpersonal, administrative and business. For realistic teaching conditions for oral surgery and implantology of human cadaver embalming method, enables drilling, dissection under conditions similar to the living body(Hölzle et al., 2012).

The study recommended the embalming technique to be ideal for teaching and practicing in implantology and oral surgery on human material. The two method of preserving human remain in the funerals for display are, Non-natural and natural which involves human embalming technique to preserve and prevent decomposition (Ajileye et al., 2018). The study recommended mortuaries should be well ventilated or equipped with extractor fans.

Western Muslims are faced with challenges like Muslim post-mortem practices that include, organ donation, funeral customs, washing, shrouding and preparing the deceased for burial attempting to follow traditional practices. The study recommended the service providers and Muslim community to address them. Funeral services require more staff because of high emotional control from consumer and service provider for quality assessment (Korai & Souiden, 2017).

The study argued that funeral service depends on proximity, integrity, integrated logistics and funeral houses. Bereavement support can be provided by funeral service providers by adopting ongoing and personalized support, and a proactive approach (Aoun, 2019). The study found that funeral providers came third most prevalent form of support after family and friend. Human remains management new proposed regulation is more stringent, making it impossible for emerging funeral directors than the current one (Maphela, 2023). The study found that current human remains management regulation is fair compared to the proposed regulation.

### 2.2.3 Factors Associated with Competency and Biosafety Skills

There are differences and similarities in professional competency for biosafety, public health and infection prevention professions a cross training opportunity for various professions (Emery et al., 2022). In the University of (PHCJ), among allied educators, higher levels of skills and knowledge in bio risk management are associated with higher levels of performance in bio risk management.

Trained and experienced nurses were better in personal protection and biosafety practices compared to nurse who have newly graduated (Bajjou et al., 2020). In Dhaka city 94% of laboratory workers have inadequate training and knowledge on biosafety measures (Islam et al., 2020). The researcher suggested cooperation of biosafety topic in the syllabus and adequate financial support. National autonomous university of Honduras has paved the way for the national biosafety culture and strengthened biosafety capacity through a technical cooperation program(Sanchez et al., 2011).

The study recommended allocation of space for biosafety training centre and the findings to be integrated into school strategic plan. In Pakistan students learn effectively and improve their awareness and knowledge of laboratory

biosafety through the Socratic Method (Muneer et al., 2021). The study emphasised the importance of learning, style of Socratic in teaching students in awareness and information of laboratory biosafety in academic setting.

## III.METHODOLOGY

### 3.1 Study Area

The study was carried out in public and private funeral homes and mortuaries in Western Kenya. The study area was selected because the region has institutions approved by TVETA and KQNA for mortuary science training, and it is found in western Kenya, which includes Kakamega, Bungoma, Vihiga and Busia counties respectively.

### 3.2 Study Design

A research design is a strategy, plan, or approach utilized to come up with solutions to research challenges. For a better understanding of the research problem, a descriptive study design was used where a cross-sectional survey was used by integrating both qualitative and quantitative research. A cross-sectional study design is a type of an observational study where a researcher measures variables at a single point in time without influencing them (Al Kilani, 2016). Data was collected at a single point in time. This design also enabled testing of cause-and-effect relationships of the variables under study. The study was employ a systematic way of gathering information (Sovacool et al., 2018). The information gathered was aimed at describing the competency and biosafety of practicing morticians practicing in Western Kenya.

### 3.3 Target Population

A study population denotes to a whole cluster of persons or elements that have same characteristics which samples are taken for measurement(McBride et al., 2021). According to the register book Kenya Health Professional Oversight Authority (KHPOA), practicing morticians in Western Kenya is registered as 102 registered practicing morticians. This study was carried out in private and public funeral homes and mortuaries in Western Kenya.

### 3.4 Sample Size Determination and Sampling Procedure

The study used cluster sampling to cluster funeral homes and mortuaries into those in Kakamega County, Vihiga County, Bungoma County and Busia County, respectively. Stratified sampling was used to identify the target population of practicing morticians practicing in different counties in Western Kenya. Purposive sampling is a method used to select the subjects who have the required information (Bordens & Abbott, 2022). Therefore, purposive sampling was also be used to select practicing morticians working in registered funeral homes and mortuaries in Western Kenya. Simple random sampling was also be used to select samples without bias from the accessible population; it is justified because it accorded each member of the population an equal and independent chance of being selected.

### 3.4.2 Sample Size Determination

Sampling is the practice of choosing a group of people to represent a wider number of subjects(Abraham et al., 2021). The goal of sampling is to identify a representative sample that would allow the researcher to learn more about the population. A sample is thus described as a more condensed group drawn from the accessible population. This research was drew a sample size using Yamane's 1973 (Kharuddin et al., 2020).

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

Where:

n = the desired sample size, N = the total population and, e = the level of statistical significance (0.5)

Therefore, the sample size for the study is

$$n = \frac{102}{1+102(0.05^2)} = 81$$

n=81

Sample size: (n=81) and attrition rate %10

Actual size 81+ AR= 89

**Table 1**

*Participants Sampling Summary Distribution Table*

| County | Mortuaries | Target Population | Proportion of Target Population | Sample Allocation |
|---|---|---|---|---|
| Kakamega | 4 | 52 | 0.51 | 45 |
| Bungoma | 2 | 12 | 0.12 | 11 |
| Vihiga | 2 | 8 | 0.08 | 7 |
| Busia | 6 | 30 | 0.29 | 26 |
| **Total** | **14** | **102** | **1.00** | **89.00** |

### 3.5 Data Collection Instruments

This makes reference to the creation of the tools that was employed in the data collection exercise. The researcher was created questionnaires, schedules small group discussions, and interviews in order to gather the necessary data in order to address the research topics.

#### 3.5.1 Questionnaires

This is one of the research strategies that is frequently used in academic studies to quickly and learn about attitudes and opinions while also learning about existing conditions and practices (Raskind et al., 2019). Ordinal, interval, and ratio data was collected via questionnaires to apply the more potent statistical methods. Questionnaires was Administered for objectives one, two, and three, which was assess the competency and biosafety among practicing morticians on skills and performance.

### 3.6 Data Analysis

Table 2 presents the matrix analysis aligned with each specific objective of the study.

**Table 2**

***Study Objective Matrix Analysis***

| Specific objective | Data analysis strategy |
|---|---|
| 1. Level of biosafety skills. | Frequency and Tables |
| 2.Competencies of practicing morticians | Descriptive data - percentage and frequencies<br>Inferential data - Chi-square |
| 3. Factors Associated with competency and biosafety | Descriptive data - percentage and frequencies<br>Inferential data - multinomial logistic regression |

## IV. FINDINGS & DISCUSSION

### 4.1 Level of Biosafety Skills among Practicing Morticians

Overall undertaken training was the use of PPEs, at 97.8%, followed by infection control and handling of biohazards material at 91% each. Handling of sharps and waste management were the least undertaken training. Figure 1 illustrates the results. The respondents were highly trained in all but two of the biosafety aspects.

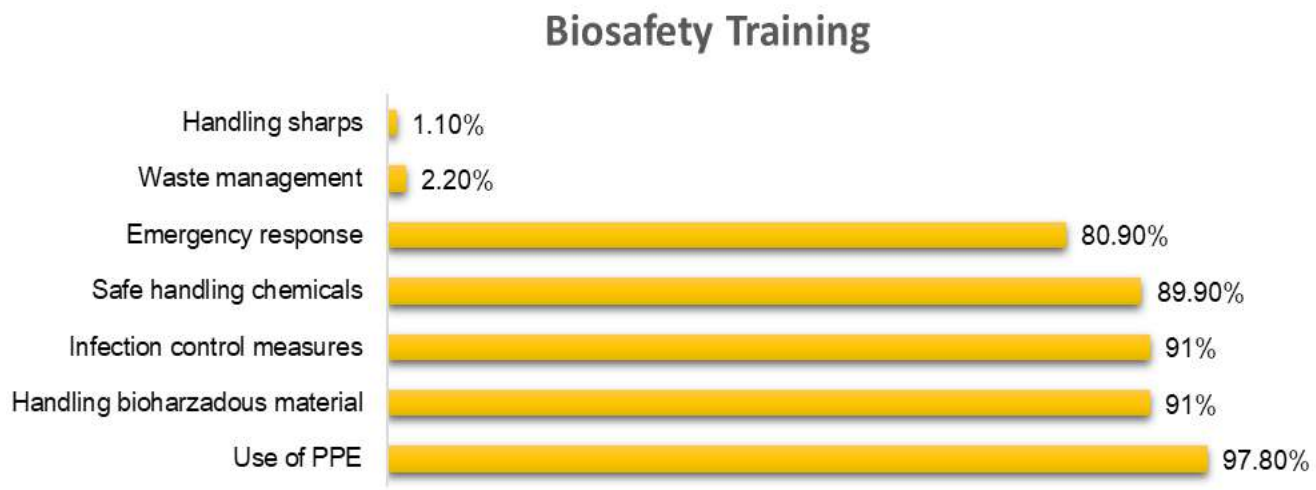


**Figure 1**

*Biosafety Skill Training Among Practicing Mortician*

#### 4.1.1 Biosafety Training

Similar to the trend in biosafety training, the respondents scored highly in biosafety practices, reporting mostly good and excellent bio-safety practice skills, especially in Handling and disposal of bio hazardous material, and Safe handling chemicals and disinfectants, where none were poor. Furthermore, the respondents reported frequently applying their biosafety skills in their practice.

**Table 3**
*Biosafety Practices*

| Practice | Frequency | Percent |
|---|---|---|
| Proper PPE use | | |
| Poor | 1 | 1.1 |
| Fair | 3 | 3.4 |
| Good | 53 | 59.6 |
| Excellent | 32 | 36.0 |
| Handling and disposal of bio hazardous material | | |
| Fair | 3 | 3.4 |
| Good | 58 | 65.2 |
| Excellent | 28 | 31.5 |
| Infection control measures | | |
| Poor | 1 | 1.1 |
| Fair | 3 | 3.4 |
| Good | 50 | 56.2 |
| Excellent | 35 | 39.3 |
| Safe handling chemicals and disinfectants | | |
| Fair | 3 | 3.4 |
| Good | 58 | 65.2 |
| Excellent | 28 | 31.5 |
| Emergency response procedures | | |
| Poor | 1 | 1.1 |
| Fair | 6 | 6.8 |
| Good | 60 | 68.2 |
| Excellent | 21 | 23.9 |

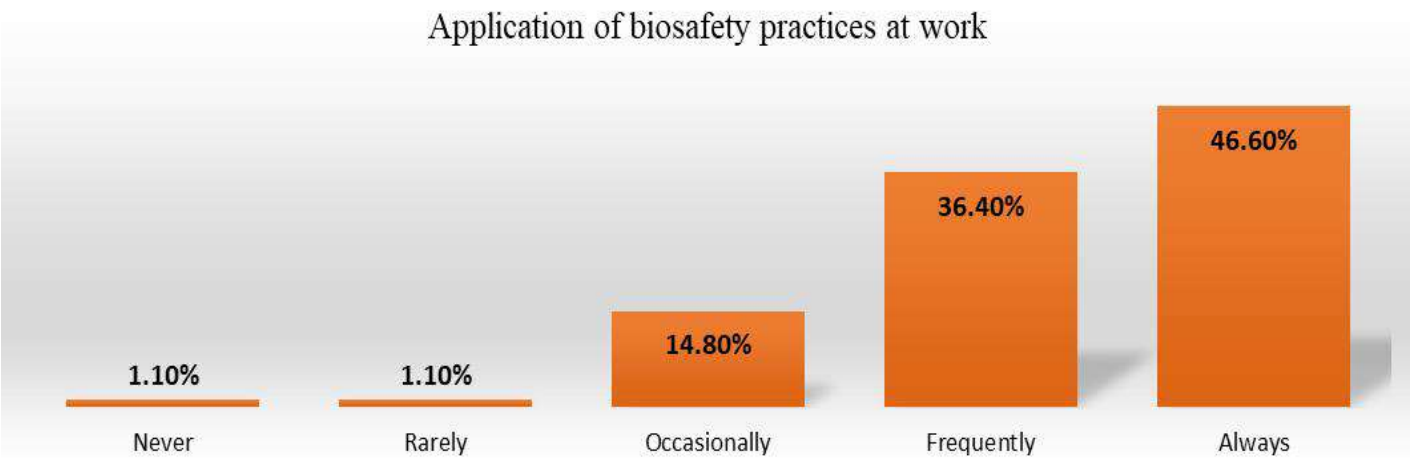


**Figure 2**
*Application of Biosafety Practices at Work*

A high level of proficiency was considered for the respondents with good skills, and who applied the skills frequently or always. 82% were found to be highly proficient as presented in below.

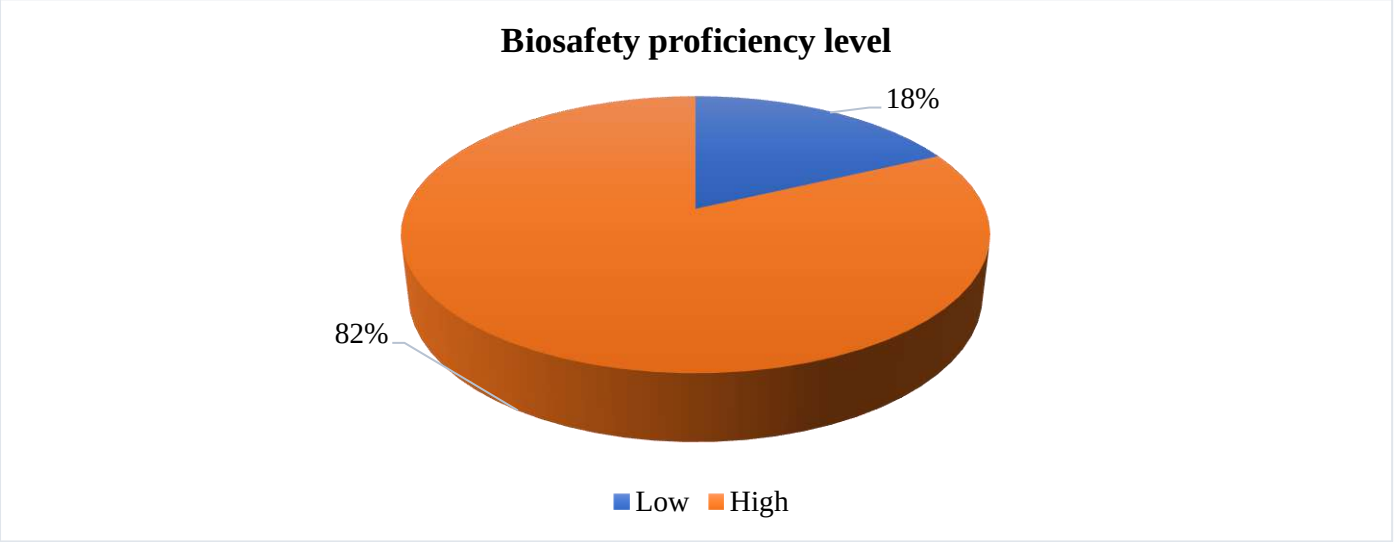


**Figure 3**
*Biosafety Proficiency*

### 4.2 Competencies Required of Practicing Morticians Technical Skills

About 53% of the respondents, which was the majority, had an intermediate level of proficiency in embalming, even though 95.5% believed they were adequately trained in the latest embalming techniques and practices. Cumulatively, n= 74 (83%) of respondents had at least an intermediate level of proficiency in compliance to health and safety guidelines, and only n=6 (6.7%) had not participated in competency-based training as continuing professional development (CPD) such as formal workshops as illustrated by results in Table 4.

**Table 4**
*Level of Technical Skills and Knowledge*

| Proficiency | Frequency | Percentage |
|---|---|---|
| Embalming | | |
| Beginner | 10 | 11.2 |
| Intermediate | 48 | 53.9 |
| Advanced | 31 | 34.8 |
| Reconstruction | | |
| Beginner | 13 | 14.6 |
| Intermediate | 41 | 46.1 |
| Advanced | 35 | 39.3 |
| Use of embalming chemicals | | |
| Beginner | 13 | 14.6 |
| Intermediate | 34 | 38.2 |
| Advanced | 42 | 47.2 |
| Health and safety compliance | | |
| Beginner | 15 | 16.9 |
| Intermediate | 34 | 38.2 |
| Advanced | 40 | 44.9 |
| Continuing education or training workshops | | |
| Never | 6 | 6.7 |
| 1-3 times a year | 66 | 74.2 |
| Over 3 times a year | 17 | 19.1 |
| Adequately trained in latest embalming techniques | | |
| No | 4 | 4.5 |
| Yes | 84 | 95.5 |

The vast majority of the respondent's n=84(94.4%) participated in health and safety compliance. Meanwhile, business management skills training was the least participated in n=64(71.9%) as presented in Table 5

**Table 5**
*Competency-Based Training*

| Competency-based training | Frequency | Percent |
|---|---|---|
| Health and safety compliance | 84 | 94.4 |
| Business management skills | 64 | 71.9 |
| Embalming techniques | 81 | 91.0 |
| Ethical and cultural competence | 73 | 82.0 |
| Restorative art | 69 | 77.5 |

Respondents who had at least an intermediate level of proficiency in embalming techniques, restorative art, the use of embalming chemicals, health and safety compliance, and participated in continuing education at least 1 to 3 times a year were considered to have high levels of proficiency in technical skill and knowledge in general. Just over half n=52(58.4%) showed a high level of proficiency.

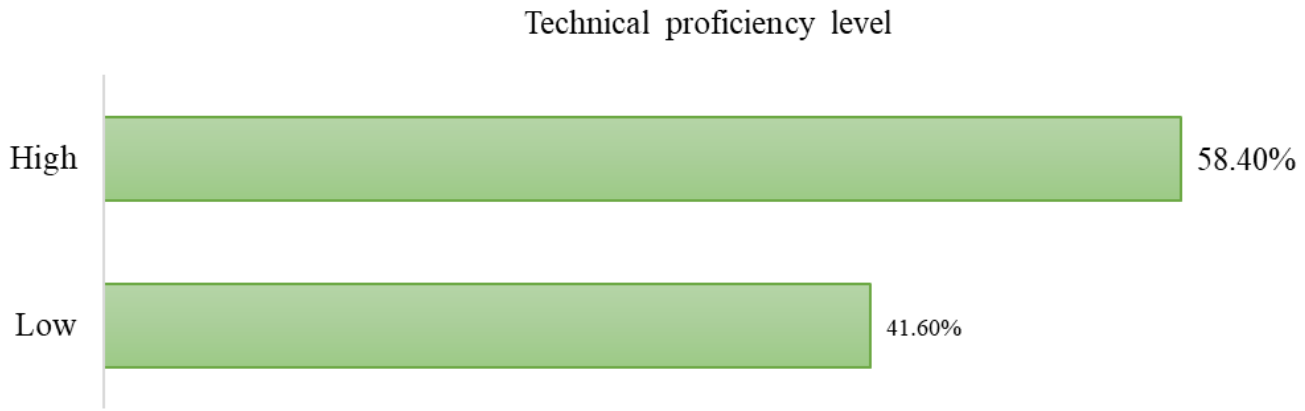


**Figure 4**
*Proficiency in Technical Skills and Knowledge*

As presented in Table 6, none of the demographic factors had any significant association with proficiency at the 95% significance level.

**Table 6**
*Association between Demographic Factors and Technical Proficiency*

| Factor | Category | Low | High | Chi (p value) |
|---|---|---|---|---|
| Gender | Male | 25(45.5) | 30(54.5) | 0.24(0.63) |
| | Female | 12(40.0) | 18(60.0) | |
| Education | Secondary | 0(0.0) | 1(100) | 1.29(0.52) |
| | Certificate in mortuary science | 35(43.2) | 46(56.7) | |
| | Ongoing | 1(25.0) | 3(75.0) | |
| Location | Kakamega | 15(33.3) | 30(66.7) | 3.41(0.33) |
| | Bungoma | 5(41.7) | 7(58.3) | |
| | Busia | 14(56.0) | 11(44.0) | |
| | Vihiga | 3(42.9) | 4(57.1) | |
| Facility type | Public | 15(34.1) | 29(65.9) | 2.20(0.33) |
| | Private | 10(52.6) | 9(47.4) | |
| | Missionary | 12(46.2) | 14(53.8) | |

### 4.2.1 Ethical and Cultural Proficiency

The vast majority of the respondents, n=87(97.8%) had training in resolving ethical issues, with a cumulative 84.3% having at least a good understanding and respect for cultural and religious practices related to death in Western Kenya. However, less than a third 27.3% reported having rarely or never ever encountering ethical issues in their

practice. Majority also reported having a good, 57.5% and excellent 29.9% ability to engage with different community members. The results are presented in Table 7.

**Table 7**
*Ethical and Cultural Proficiency*

| Factor | Frequency | Percentage |
|---|---|---|
| Understanding & respect for cultural& religious rites | | |
| Poor | 2 | 2.2 |
| Fair | 12 | 13.5 |
| Good | 47 | 52.8 |
| Excellent | 28 | 31.5 |
| Frequency of encountering ethical issues | | |
| Never | 5 | 5.7 |
| Rarely | 19 | 21.6 |
| Sometimes | 36 | 40.9 |
| Often | 28 | 31.8 |
| Trained in resolving ethical issues | | |
| No | 2 | 2.2 |
| Yes | 87 | 97.8 |
| Ability to engage with different community members | | |
| Poor | 3 | 3.4 |
| Fair | 8 | 9.2 |
| Good | 50 | 57.5 |
| Excellent | 26 | 29.9 |

Respondents trained in resolving ethical issue, and at least a good understanding of the region's death rites, and rarely had ethical issues, as well as at least a good ability to engage with different community members were considered to have a high level of ethical proficiency, of which, 86.5% had a high level of ethical proficiency as illustrated in figure 5

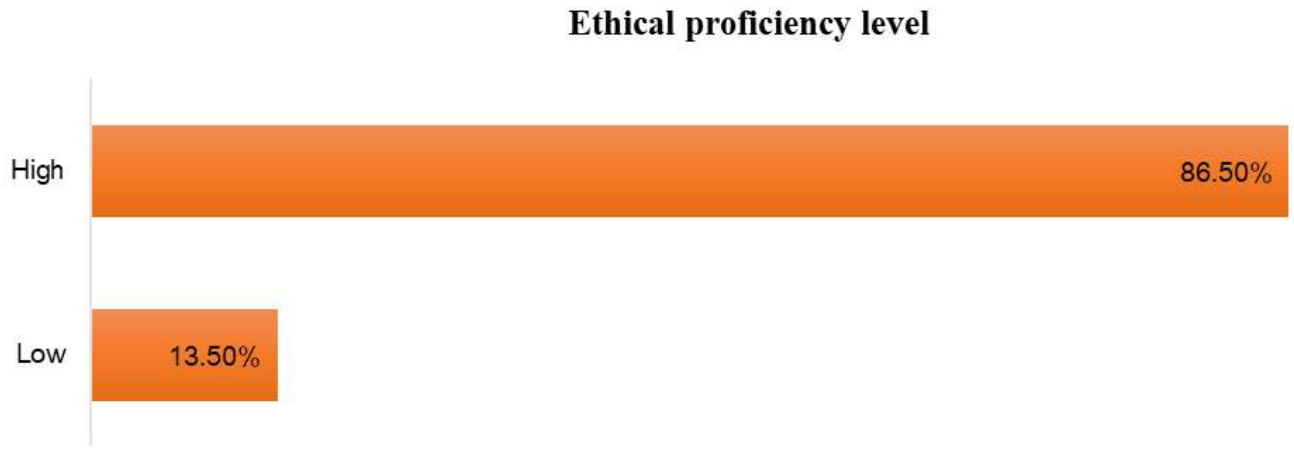


**Figure 5**
*Ethical and Cultural Proficiency*

A significant association was not found between the level of ethical proficiency and any of the demographic factors at the 5% level of significance as shown in Table 8.

**Table 8**

*Association between Ethical Proficiency and Demographic Factors*

| Factor | Category | Low | High | Chi (p value) |
|---|---|---|---|---|
| Gender | Male | 9(16.4) | 46(83.6) | 0.65(0.42) |
| | Female | 3(10.0) | 27(90.0) | |
| Education | Certificate in mortuary science | 12(14.8) | 69(85.2) | 0.87(0.65) |
| | Ongoing | 0 | 4(100) | |
| Location | Kakamega | 3(6.7) | 42 | 6.62(0.09) |
| | Bungoma | 3(25.0) | 9(75.0) | |
| | Busia | 6(24.0) | 19(76.0) | |
| | Vihiga | 0(0.0) | 7(100.0) | |
| Facility type | Public | 6(13.6) | 38(86.4) | 0.17(0.92) |
| | Private | 3(15.8) | 16(84.2) | |
| | Missionary | 3(11.5) | 23(88.5) | |

### 4.2.2 Business Proficiency

Most of the respondents received formal training in business management 86.5%, with 30.3% indicating advanced level of proficiency in funeral planning management, and n=18(20.7%) having a low(beginner) level proficiency in financial management &budgeting. Only 6.7% deemed the business training they receive to have poorly prepared them for the business aspect of running a mortuary as presented in Table 9.

**Table 9**

*Business Proficiency*

| Factor | Frequency | Percent |
|---|---|---|
| Funeral planning management | | |
| Beginner | 20 | 22.5 |
| Intermediate | 42 | 47.2 |
| Advanced | 27 | 30.3 |
| Customer service & client communication | | |
| Beginner | 15 | 17.0 |
| Intermediate | 36 | 40.9 |
| Advanced | 37 | 42.0 |
| Financial management &budgeting | | |
| Beginner | 18 | 20.7 |
| Intermediate | 43 | 49.4 |
| Advanced | 26 | 29.9 |
| Formal training business management | | |
| No | 12 | 13.5 |
| Yes | 77 | 86.5 |
| Business training fit in running mortuary | | |
| Poorly | 6 | 6.7 |
| Fairly well | 33 | 37.1 |
| Well | 22 | 24.7 |
| Very well | 28 | 31.5 |

Respondents with a formal training and at least an intermediate level of proficiency in funeral planning management, customer service & client communication, and financial management and budgeting were considered high in business proficiency as shown in figure 6.

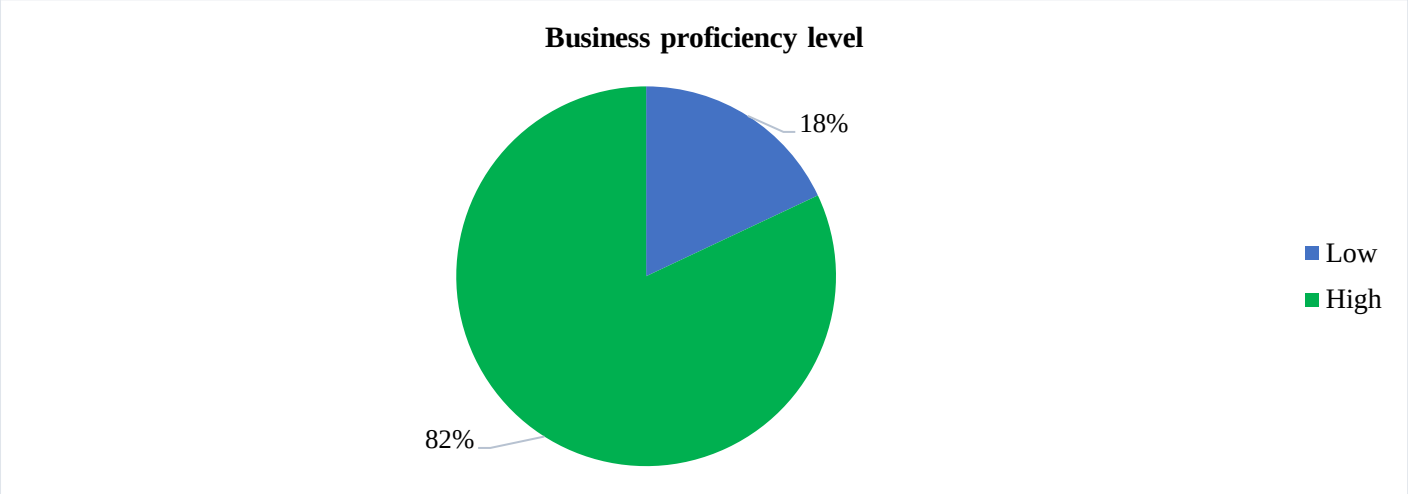


**Figure 6**
*Business Proficiency Level*

The demographic factors had no significant association with business proficiency as presented in Table 10

**Table 10**
*Association between Business Proficiency and Demographic Factors*

| Factor | Category | Low | High | Chi (p value) |
|---|---|---|---|---|
| Gender | Male | 11(20.0) | 44(80.0) | 1.08(0.30) |
| | Female | 9(30.0) | 21(70.0) | |
| Education | Certificate in mortuary science | 20(24.7) | 61(75.3) | 0.00(0.99) |
| | Ongoing | 1(25.0) | 3(75.0) | |
| Location | Kakamega | 10(22.2) | 35(77.8) | 4.16(0.25) |
| | Bungoma | 3(25.0) | 9(75.0) | |
| | Busia | 9(36.0) | 16(64.0) | |
| | Vihiga | 0(0.0) | 7(100.0) | |
| Facility type | Public | 10(22.7) | 34(77.3) | 2.28(0.32) |
| | Private | 3(15.8) | 16(84.2) | |
| | Missionary | 9(34.6) | 17(65.4) | |

To determine the competence level of the practicing morticians, respondents with a high proficiency level in at least three of the four measured; biosafety, technical skills and knowledge, business management, and ethical proficiency, were considered to be competent. 71% of the practicing morticians were found to be competent as illustrated in figure 7

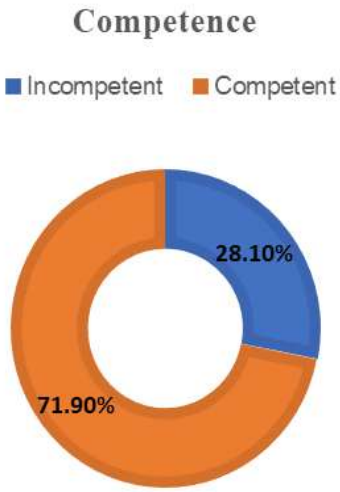


**Figure 7**
*Competence Level of Practicing Morticians*

### 4.2.3 Factors Associated with Competency among Practicing Morticians

A multinomial logistic regression analysis was carried out to assess the predictors of competence in practicing morticians. Facility type was found to significantly predict competence with practicing morticians in public hospitals being 2.13 time as likely to be competent compared to those in missionary facilities, (AOR = 2.13, 95% CI = 1.39 – 6.13), while those in private facilities were 1.75 times as likely compared to their missionary counterparts (AOR = 1.75, 95% CI = 1.38-6.36). Practicing morticians in Kakamega were 69% less likely to be competent compared to those in Vihiga, while those in Bungoma were 1.17 times more likely to be competent compared to Vihiga. Table 11 contains the results.

**Table 11**

*Predictors of Competence among Practicing Morticians*

| Factor | Category | AOR (95% ci) | p value |
|---|---|---|---|
| Age | Age | 1.05(0.86-1.27) | 0.64 |
| Experience | Experience | 1.01(0.68-1.52) | 0.94 |
| Gender | Male | 0.4(0.09-1.85) | 0.24 |
| | Female | Ref | |
| Education | Certificate mortuary science | 0.28(0.01-7.02) | 0.44 |
| | Ongoing | Ref | |
| County | Kakamega | 0.31(0.04-2.54) | <0.01 |
| | Bungoma | 1.17(0.12-11.18) | <0.01 |
| | Busia | 0.88(0.11-7.09) | <0.01 |
| | Vihiga | Ref | |
| Facility type | Public | 2.13(1.39-6.13) | 0.02 |
| | Private | 1.75(1.38-6.36) | 0.03 |
| | Missionary | Ref | |
| Frequency of applying knowledge& skills from CB training | Occasionally | 0.65(0.05-8.79) | 0.74 |
| | Frequently | 1.32(0.26-6.83) | 0.74 |
| | Always | Ref | |
| Training frequency biosafety practices | Never | 1.47(0.03-71.64) | 0.85 |
| | Once a year | 0.7(0.03-18.44) | 0.83 |
| | Twice a year | 2.06(0.05-79.95) | 0.70 |
| | Over twice a year | Ref | |
| Participated CB training last 1 year | None | 0.06(0.03-1.39) | |
| | 1 | 0.23(0.01-6.2) | 0.38 |
| | 2 to 3 | 2.29(0.09-56.92) | 0.61 |
| | 4 and above | Ref | |

## 4.3 Discussion

### 4.3.1 Level of Biosafety Skills and Knowledge

A high level of proficiency and adherence n= 70 (82%), was found for biosafety among practicing morticians in the current study. Research by Akinyemi et al. (2021) supported those by Roskind et al. (2019) that knowledge overall, knowledge on the use of PPEs was high among practicing morticians , however, in practice, it was found that hand gloves and isolation gowns were the most consistently highly used PPEs, with varying degrees of use for other forms of PPE (Akinyemi et. al, 2021). Further, Dumahasi (2020) had found that public facilities rarely ever provided the full complement of PPEs to the practicing morticians as required by the IPC protocols. The current study did not explore the use of individual PPEs; however, the high overall practice of using PPEs at work was in line with other scholars across the continent.

### 4.3.2 Competence Level of Practicing Morticians Technical skills and knowledge

In regards to preparing bodies, most of the practicing morticians in this study were found to have at least an intermediate level of proficiency. Embalming with solutions of formalin was demonstrated to be widespread, even though different mixtures and formulations were used (Nnamdi, 2017). While the current study sought to assess the levels of proficiency in embalming and the use of chemicals, most existing literature focus on the risks faced by practicing morticians in the embalming process. Scholars such as Douglas and Peterside (2016), Nnamdi (2017) and Akinyemi *et al.* (2021) all identified the risk of injuries such as cuts, while Nnamdi (2018) further identified risks associated with the chemicals such as formalin causing catarrh and cough, and body weakness.

Contrary to the findings of Snare (2020), a large proportion of practicing morticians in this study reported participating in continuing education within the last 12 months. Snare (2020) identified that practicing morticians in the

Kerala society did not receive any further training beyond the formal mortician education. However, this difference can be attributed to the fact that their study was carried out in the context of the COVID-19 pandemic. As was established by Maphela (2023), continuing education among practicing morticians is a good intervention measure to alleviate the risks associated with the occupation. Despite this, Emery et al. (2022) determined that mortuary workers did not engage in safety training organized by the management; neither did they participate in periodic medical exercise and safety talks. Knowledge of health and safety practices required of practicing morticians was found to be high in the country. This aligns with the findings of this study, wherein 87% of the practicing morticians had at least an intermediate proficiency level in health and safety. In addition, the demographic characteristics were found to have no significant association with technical proficiency in this study.

*Ethical and cultural proficiency:* This study finds a high level of proficiency in ethical and cultural practices required of practicing morticians. More than two thirds were found to have a good understanding of the local cultural and religious rites, with 98% formally trained as part of their course. Despite this, the majority reported encountering ethical and cultural issues in their work, and a good capacity to engage with bereaved family members. Among professional grief counsellors, (Rizany et al., 2018) found that counsellors who had dedicated training on grief counselling performed better than those trained as part of the course material. This was despite the finding that the perceived competence between the two groups was not statistically different. This speaks to the training the practicing morticians receive in dealing with bereaved families. While the integrated training is adequate, dedicated training is required as it improves their proficiency in this regard. In exploring the ethical and cultural issues related to burial in West Kenya, Shaha et.al (2013) found that there was the desire to understand why death occurred, especially in cases of child death. This may cause ethical dilemmas, for example in cases where there are legal investigations (Maphela, 2023). An understanding of the local rites ensures that practicing morticians are able to handle death, rumours and myths, and unmet expectations from families.

### 4.3.3 Factors Associated with Competency among Practicing Morticians

Facility type was found to significantly predict competence, with practicing morticians in public hospitals being more competent. This finding was partially in line with those by (Dumahasi, 2020), who found differences in performance between public and private facilities. However, the differences they found were weighted more towards provision of equipment. The findings on the factors associated with competency in this study, where individual demographic factors and training had no effect on competency, were contrary to the findings of (Liu & Mao, 2020). Their study on family doctors showed that education level and job title, work team dynamics, training, grasp of specific content, and understanding of the family doctor system were significantly associated with competency. They further found that competency and work cognition had a significant impact on work stability. The differences may arise from the differences in the target populations; however, it is possible that their findings on work stability may hold in the field of mortuary science due to the contact with families. By comparison, among nurses, work experience, type of nursing environment, educational level, adherence to professionalism, and critical thinking were the predictors of competency(Rizany et al., 2018). Of these, work experience and education were shown to the most influential for the development of competency of nurses.

## V. CONCLUSION & RECOMMENDATIONS

### 5.1 Conclusion

The current study assessed the level of proficiency and competence among practicing morticians in the Western region of Kenya, and the influencing factors on competence. Proficiency was measured in technical skills, business management, ethics and culture, and biosafety. The overall proficiency in all the skills, technical skills were high, over 80%, as were their constituent factors. The proficiency in technical skills, however, was moderate, with near half split between low and high level of proficiency. Demographic factors were not influential in determining any of the proficiencies. Overall competency was found to be high and individual demographic factors such as age and sex were determined not be predictors of competence. However, county and practice and type of facility influenced competence, with those in public facilities being over twice as likely to be competent as those in missionary facilities.

### 5.2 Recommendations

There is need to put more emphasis on technical training, as this was the least performed element among the practicing morticians. Literature from counsellors shows that dedicated training results in better performance. The study on the other hand, finds that the training practicing morticians receive is integrated into their coursework, thus, there need to be dedicated training in areas such as ethics and business management.

Comparisons to other countries and related fields show that the availability of equipment greatly influence adherence to guidelines, therefore, it is imperative for facilities' management to avail required equipment e.g. PPEs and

disposal facilities. There is limited research into the skill, and competency of practicing morticians In general. This type of study gives insight into the current professional profile and performance, thus more research is needed to form a basis for training that target areas of deficiency. The current study explores the type of competency-based training the practicing morticians receive. However, it did not delve into the effect of this training on the proficiency of practicing morticians, which is an area that needs further research. The current studies uses data from practicing morticians only, however, future research needs to incorporate input from users of their services

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