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Health Determinants on Sustainable Alternative Primary Prevention against COVID-19 and Dead Uptakes as Cadavers' Distinct Medical Educational Tools in Western Kenya

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ABSTRACT

Health determinants on sustainable alternative medicine and primary prevention against coronavirus disease 2019, (COVID, 19), that lack cure, is determined by quality uptake of Non pharmaceutical Interventions (NPIs); regular hygiene and sanitation, keep social distance and proper uptake face masks. (Alternative medicine),100^{o}C COVID 19 steaming cycles, in fermented green tea leaves enables active functional warmth of the anatomical lower Respiratory system and utilization of fresh arterial embalmment of COVID 19 corpses for cadaver preparations. Fermented green tea leaves contain flavonoids compounds that produce catechins to open up infected alveoli in early stages of infection. Flavonoids also contain theaflavins that kills corona viruses. Most viruses are killed at 60c^{o} to 70^{o}C inhaled steam cycles along pharynxes, Embalmment contain 8 ingredients whose preparation is determined by case analysis to mediate hygiene. Early COVID19 clinical symptoms: fever, sore throat and coughing, may be efficiently managed by 100^{o}C COVID 19 steam cycles boiling in fermented green tea leaves. Late clinical symptoms are dyspnea, due to aseptic shock attributed to both sudden low blood pressure and low temperatures below 37^{o}C in the lower respiratory system to cause *sudden Broncho Constrictions* and deaths. Study attributed lower temperature of oxygen inhalation in lower respiratory system (not warmth to 37^{o}C), in corona patients to more deaths witnessed in ICUs than in Home based care. Hence the study opted to ascertain Health determinants on sustainable alternative medicine and primary prevention against COVID 19, and ways to utilize infected corpse to process cadavers. Specifically, examined utilization of 100^{o}C, COVID 19 Steam cycles in fermented green tea leaves as an alternative medicine. Uptake of NPIs, as basic hygiene measures. Lastly investigated on role embalmment of COVID 19 corpse, as distinct medical tools for education. Descriptive cross sectional, longitudinal cohort designs of mixed approaches were exploited, i.e. survey and interviews. Sampling designs were purposive prospective, retrospective. Survey used semi structured questionnaire to explore on quantitative data. KII and FGD interview guides were exploited in active interviews for qualitative data using sample size of 250 participants. Global and regional data observations on COVID 19 trends, were explored using 3Ls to determine virulence variations. Results demonstrated, 98% COVID 19 deaths are attributed to limited uptake of alternative medicine, since it had not been approved by WHO. Majority of participants ascertained that in the beginning of pandemic 100% of COVID 19 associated deaths cases, were neither embalmed nor disinfected before disposal, due to WHO restrictions. Thus a social genocides to the study region on their social customs and cultures. Hence majority affected health population, opted to plan for cool night exhumations. Which exposed them to higher health risks of OD (1.7,) RR (1, 7.7). 100^{o}C COVID steam cycle was efficiency and accessible, as noted by discussants. But had limited MOH support. Uptake of NPIs was skewed (25%) with insignificant increase of infection among the population health. MOH failed to classify Red and Blue COVID 19 zones to enable holistic informed health behavior change. Up keep of 6 feet social distance was also insignificant during most public

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gatherings. Thus, need to mediate and advocate for alternative medicine awareness during emergency of the pandemics to enhance main aim of primary prevention.

Keywords: COVID 19; flavonoids; catechins; theaflavin; fresh embalmment fluid; 100^{o}C steam; population health; alternative medicine.

1. INTRODUCTION

1.1 Background Information of the Study

The novel coronavirus disease (COVID-19) is a global health disease discovery in Wuhan, China in December 2019, [1,2,3]. Most observational and epidemiological studies suggest that COVID-19, affects older cohorts of 56 years and above, with other underlying diseases like hypertension, diabetes, obesity, chronic lung diseases. Clinical studies attributes low female susceptibility to COVID 19 with their marked reduction levels in *cytokine production*, higher numbers macrophage and neutrophil activity for immune response than male counterparts who have high level of cytokines production and few numbers of neutrophils and macrophages, [4]. Females gender have also low expressions of *angiotensin-converting enzyme 2 (ACE2*) in their kidneys than males gender. The clinical presentations of symptomatic COVID 19 patients are fever, dyspnea, cough, fatigue, and sore throat. Gastrointestinal symptoms are nausea, vomiting, diarrhea, and abdominal pains, [5]. In advanced cases, patients may rapidly develop respiratory failure with acute respiratory distress syndrome, due to aseptic shock associated with drop in blood pressures and even progress to death, due to attributed anatomical dysfunctions of main respiratory system [4].

Tea (Camellia sinensis, contain over 300 compounds but most common ones are alkaloids/ flavonoid and tannins which are produced depending on how tea leaves are processed after harvested in their fresh and green. Majority of population health like the global health, have limited knowledge on what steam COVID 19, in fermented green tea leaves to provide catechins and theaflavins [6,7,8]. Regular inhalation of 100^{o}C fermented Green tea Leaves 100c^{o}.Steam cycles are considered to be useful in damaging the capsid of COVID 19 envelope and prevent infection in human body. Thus European Pharmacopoeia VI edition has recommended steam inhalations as a procedure to treat respiratory diseases, [6,7,8]. The global mortality updates on COVID 19 by mid of December, 2020 were 1,635,464 deaths, [9]. Country with highest mortality, United States of America 303,797 deaths, and least country with mortality, Vanuatu in South Pacific Ocean Nation, with 8 islands had 1 dead. Regionally, Kenya had the highest mortality rates of 92,459 deaths and Tanzania had the least, 509 deaths, [10]. The global mortality rates help to measure the burden of COVID-19 deaths, which is globally being reported differently using case fatality ratios: the number of deaths divided by the number of confirmed cases. Global differences in mortality numbers are closely attributed with race variations and variations in number of people tested. Thus more you test more people with milder cases are identified, and hence lowering the case-fatality ratio. Also mortality may rise as the facilities become overwhelmed with COVID 19 patients, and have limited resources. Thus vital need to initiate public health prevention, at home based care units and health promotion approaches to enable holistic and comprehensive uptake of disease management and safe disposal to prevent community transmission, and enable primary prevention.

Globally and regionally most MOHs imposed heavy curfews and lockdowns to its specific population health, [11], and prolonged restrictions (quarantine measures) to limited movement and reduce community transmission, thus limit number of unclaimed dead for cadavers preparations, [12], which forms distinct tools for education. Global misinformation, fear, and hysteria led to myths of environmental contamination, Funeral Consumers, (2011), which spread throughout global mortuary service providers are associated with limited knowledge on utilization of arterial fluids, [13], lack of job specialization and descriptions in majority of facility morgues in Sub Saharan Africa and limited empowerment on knowledge on the wide range mortuary services offered, [14], thus causing limited empowerments and sustainability of quality mortuary services required to be executed during the COVID 19 pandemic. Despite the global establishment of safe standards of disposal of COVID 19 deaths using health determinants of safe infection prevention control and health promotion interventions to enable health behavior change on COVID 19, the Sub Saharan Africa still lacks

quality public health approaches to enable, advocate and mediate for holistic and comprehensive uptake of both primary prevention and machinery arterial embalmment, [15,16,17]. Prolonged limited application of primary prevention interventions are attributed with low health behavior change on the disease management. Thus the timely need for the study to ascertain Health determinants on sustainable alternative primary prevention against COVID 19 and Corpse utilization as cadavers, distinct tools for medical education in Western Kenya.

2. MATERIALS AND METHODS

2.1 Anatomy of Respiratory System and Functions in Relation to Active COVID 19 Infection

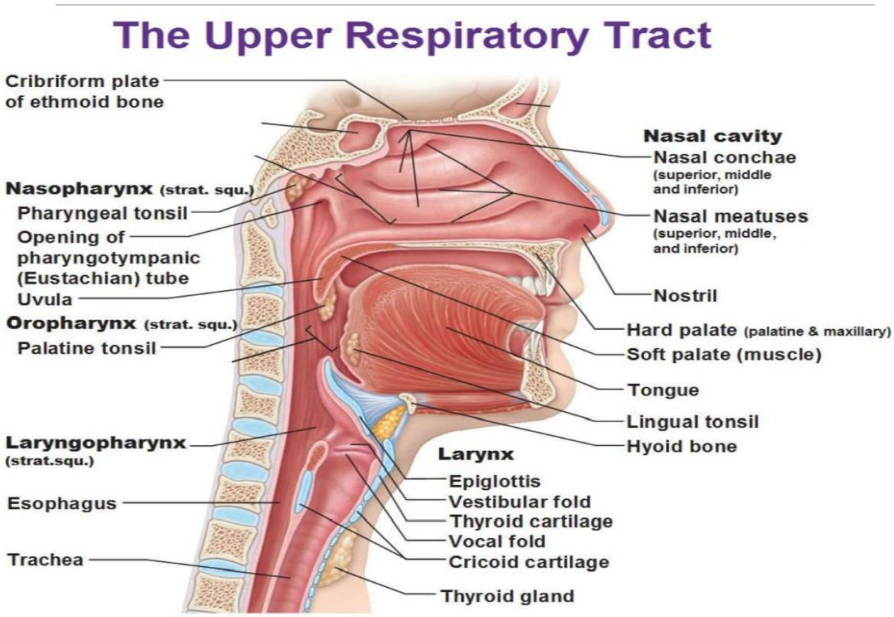


Fig. 1.

Main function of the respiratory system is to facilitate gases exchange between external environment, blood and peripheral tissues, which is enabled by following key functions [18]:

2.1.1 Removal of inhaled foreign particles and infectious organisms from respiratory system

Upper respiratory tract contain moist surface, covered by mucus to trap large particles such as COVID 19 thus prevent them from reaching the lower respiratory tract, nasal mucosa is lined by a ciliated epithelium of cilia beating towards the pharynx / wind pipe to enable swallowing of any foreign material into stomach [17,18]. The nasal cavity also contain hair, covered with mucus to mediate as a filter and is supplied with sensory nerve endings from trigeminal nerve, which are sensitive to any irritants inhaled via sneezing reflex response to eliminate the activated particles through the nose thus when they land on hard surface form fomites which can be transmitted indirectly by cross infection. [17,18].

The lower respiratory tract, begins at above the level of respiratory bronchioles lined with mucoid columnar ciliated epithelium of the cells to enable the traps of foreign particles and expelled them out by co- ordinated movement of cilia in the lower respiratory tract in an upward direction (towards the pharynx/wind pipe). The *glosso-pharyngeal* and *vagal nerve* in lower respiratory tract, initiate cough reflex in response to stretching and irritation to expel foreign particles entering the lower respiratory tract to expel out COVID 19 by droplet infection or fomites. The alveoli are secured by macrophages which are responsible for engulfing the foreign particles and the organisms entering the alveoli. Also mucus covering nasal, nasopharyngeal and the lower respiratory tract is enriched with

immunoglobulin A, (IgA) and lactoferrin, preventing microbes from colonizing respiratory epithelium. The tonsils in pharynx (an aggregation of lymphoid tissue associated with the mucosa) also provide immune functions to respiratory system [18,19].

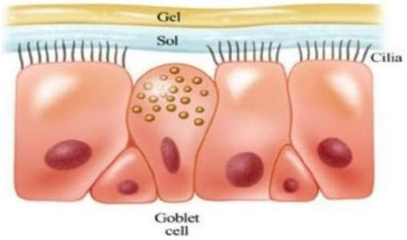


Fig. 2.

2.1.2 Sensation of smell, (Olfaction)

The roof of nasal cavity has nerve endings to detect different smells and traverse the ethmoid plate and form olfactory bulb that may influence lack of appetite among COVID 19 patients.

2.1.3 Warming and humidification of Air

Inhaled air flows across the warm and moist upper airways called nasal meatus and conchae. so by the time the air reaches the lower airways, (respiratory bronchioles), the air is saturated with water vapor (i.e. the air carries the maximum amount of water vapor that it can occupy at the body temperature) and is warmed up to 37^{o}C basically to prevent dehydration of the lower respiratory tract and ***prevent reflex broncho-constriction*** that is associated with cold air exposed to lower respiratory tract. Thus aseptic shock. Which is common clinical symptom of patient with severe COVID 19 admitted in intensive care unit, [17,18,20].

2.1.4 Phonation

The larynx/ throat contain two vocal cords that forms a central orifice called glottis/ voice box, whose size may be altered by contraction of the laryngeal muscles to produce sound. The vocal cords can be brought to a position to enable them vibrate by force of exhaling air and produce the sound. The pitch of sound produced may be altered by variation in sizing the glottis/ voice box i.e. by contraction and relaxation of the laryngeal muscles [17,18,19]. The produced sound may be modified by articulations/ movements of the oral cavity and the tongue, forming words and is affected during the infection with COVID 19 virus.

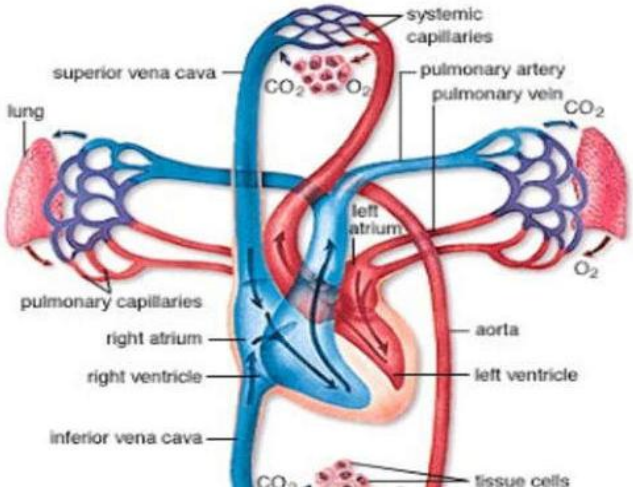


Fig. 3.

2.1.5 Filtration of blood at the pulmonary capillaries

Venous blood entering right side of the heart is passed through pulmonary capillaries, before reaching the left side of the heart to be distributed in the body. When blood passes into small caliber of pulmonary capillaries with large particles of emboli, air bubbles, cell debris and fat globules they get trapped in the pulmonary vessels blocking the systemic blood circulation, thus any obstruction to smooth flow of blood into brain result to coma, obstruction to smooth flow into lungs results to asypxia, while obstruction to smooth flow into heart result to cardiac arrest.as intermediate cause of mortality among COVID 19 patients, [17,18,21].

2.1.6 Acting as a reservoir of blood

Pulmonary vascular bed is ***a low pressure system*** that must occupy a large volume of blood at a. constantly rate. Any presence of a hypovolaemic state, in pulmonary vascular bed during COVID 19 morbidity may results to ***pulmonary vessels constrict***, attributed with the increased blood into flow the systemic circulation and supplement effective volume in the general circulation, [17,18,21].

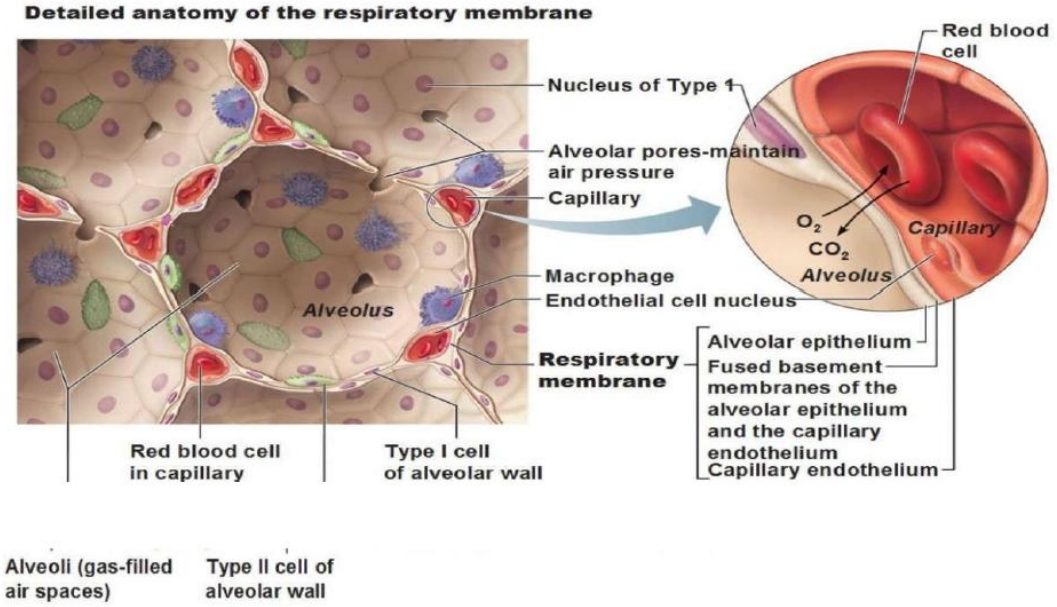


Fig. 4.

2.1.7 Metabolic functions of pulmonary tissue

The lower airways (respiratory bronchioles), are lined by a large number of neuro-endocrine cells to secrete and release of chemical mediators known as bradykinin, prostaglandins, serotonin, substance P, *heparin and histamine*. Pulmonary tissue is responsible for the conversion of angiotensin I to angiotensin II and the catabolism of bradykinins, adrenaline and noradrenaline. The lung waste products and metabolites are excreted through the lungs as volatile gases such as ethanol, acetone, and ketones in case of COVID 19 patients with diabetes mellitus, [17,18,21].

2.2 Role of 100^{o}C COVID 19 Steam Cycle Inhalation in Fermented Green Tea as an Alternative Medicine for Early Infection

Tea (Camellia sinensis, contain over 300 compounds. The most common ones are alkaloids/ flavonoid and tannins which are produced depending on how tea leaves are processed after harvested in their fresh and green fermented, [6,8].

COVID 19 is an RNA virus coated with a capsid and a peri-capsid crossed by glycoprotein molecules. The external protein structure attacks human cells, is a potential target to therapeutic interventions against virus replication in airways. 100^{o}C.Steam inhalation cycles of flavonoids contain catechins and theaflavins which are considered to be useful in damaging the capsid of COVID 19 envelope and prevent infection in human body,

[60] Thus European Pharmacy VI edition has recommended steam inhalations as a procedure to treat respiratory diseases, [7].

High temperature cause irreversible denaturation of proteins and loss of COVID 19. COVID 19 infectivity after boiling in fermented green strong tea at 100Co for 15 and 30 min in liquid environments is lowered. Steaming cycles is aimed at damaging COVID 19 capsid (bactericidal), similar to European Pharmacy VI edition steam inhalations, used to treat most respiratory diseases. While fermentable green tea leaves in steam aims at producing catechin to supplements opening of alveoli of infected lung and theaflavin kills corona virus to improve the prognosis of Corona patients using alternative medicine. Tea contain more caffeine than coffee but is soft since tea has tannin that easily converted to theine – better taste and mental performance stimulant of CNS, and heartbeats, , [7].

Currently there is no safe and effective antivirals to treat COVID 19 infection. Thus mediation of Non-Pharmaceutical Interventions (NPIs),[22] such as wearing masks in public, social distancing and regular hand washing to promote community live hoods. COVID 19 is an RNA virus coated with a capsid and a peri-capsid crossed by glycoprotein molecules. The external protein structure attacks human cells, is a potential target to therapeutic interventions against virus replication in airways, [19]. Regular inhalation of 100C^{o} fermented Green tea Leaves 100c^{o}. Steam cycles are considered to be useful in damaging the capsid of COVID 19 envelope and prevent infection in human body Thus European Pharmacopoeia VI edition has recommended steam inhalations as a procedure to treat respiratory diseases, [6,8] Regular COVID 19 inhalation steaming in fermentable green/ strong tea at 100C^{o} demonstrated to be more effective and efficiency in reducing the high rate of morbidities compared to regular quarantine and isolation policy measures that may delay early achievement of herd immunity. Anatomically COVID 19 microbes are located in the posterior noise, and are easily killed by hot temperatures of (60^{o}C – 70^{o}C) [23,7]. Fermented green tea leaves/green and fresh from the farm contain catechins and theaflavins the enable the opening of alveoli of the infected lung. Desk information opined that drinking warm drinks dislodges COVID 19, accumulation around oral pharynx to be swallowed direct into stomach thus may be killed by stomach HCL acid before inhaled into bronchi of lung [17,18,14]. Population health eating ginger, garlic, watermelon oranges and lemons boost their body immunity to reduce potential risk of developing COVID 19 disease, (*Appendix 2 and 3*).

High temperature cause irreversible denaturation of proteins and loss of COVID 19 and SARS CoV-2 infectivity after boiling in non-fermentable strong tea at 100C^{o} for 15 and 30 min in liquid environments. Steaming aimed at damaging COVID 19, capsid through steam inhalation cycles similar to European Pharmacy VI edition steam inhalations used as a procedure to treat of respiratory diseases, [7,8].

2.3 Knowledge Attitude and Practices on Embalmment of COVID 19 corpses

In 2014, regional mortuary science encountered Ebola epidemic in west and central Africa whose virulence was severe compared to novel coronavirus disease 2019,(COVID 19), that has transformed global health care system and mortuary services with limited observations of other simple illness, communicable diseases and large mortalities of Deaths in span of short period in Developed countries. Thus urgent needs to protect the larger population health from exposure of COVID 19, [1,22], through enabling and advocating application of freshly prepared embalmer fluid that contain: methyl alcohol, phenol crystal, formaldehyde sodium citrate, sodium chloride, glycerol, and sodium laury sulphate a surfactant which was introduced to anatomical embalmment, by Laskowski in the mid-19th century [12] and sodium hypo chlorite solution that is microbial disinfectant used in isolation with specific analysis, [13,20].

The global health have revolutionized models of safe infection prevention control measures on COVID 19 deaths to enable safe transportation, disposal and dissection as distinct educational tools, OSHA, [24,25]. But they have global limited on nested, intersectoral collaboration and empowerment for recruiting qualified embalmers to execute quality embalmment procedures, which continue to pose a big global health challenge in African societies that have consistent values attached to the living dead: cultures, religious virtues and norms, which were ignored due to fear of COVID 19 transmissions, hence the COVID 19 corpse were neither embalmed nor disinfected to enable dignified disposal to happen, or neatly mummified to allow cadaver's dissection, [14]. Some myths have persisted concerning COVID 19 potentials to pollute the environment in relation to the manner of disposal of COVID dead, [24]. In mortuary and forensic science, the main sources of infection after death of any human being are basically body fluids such as blood, saliva ascetic fluids, pleura fluids, and gestural intestinal fluid, waste products such as fecal material, CDC, (2020), and urine, aerosol of infection material released through the mouth and nose, microbes on the skin surface such COVID 19 or Ebola may be acquired by direct contact that need to contain immediately after death, [26]. Transmission of infective COVID 19 pathogens to susceptible host (population health) requires 3 elements to occur: Source who are dead or infective subjects, COVID 19 pathogens is a reservoir host for the infective agent and the population health is the susceptible host, to receive the COVID 19 pathogens, and the mode of transmission may be contact or (inhalation) airborne, [27].

Infection transmission between the infective agent (dead or objects) and susceptible host may cause disease to develop and progress into illness after 21 days of contact for COVID 19, [28]. The most common clinical presentations of symptomatic suspected individuals infected with COVID 19, are fever, dyspnea, cough, fatigue, and sore throat. Gastrointestinal symptoms are nausea, vomiting, diarrhea, and abdominal pains, [5]. Dead body may remain potentially infective with viable pathogens colonizing the tissue organs at varying rate before they die, for instance after death ,COVID 19 pathogens last for 48hrs like most of the viruses except HIV / AID virus which last for more 16hrs in blood before they die [29,30]. If dead bodies are not decontaminated thoroughly by embalmment, they cause infection by inhalation (airborne), or autopsy contact, within the 48hrs after dead for COVID 19, [23].

Main sources of COVID 19 transmissions after death are determined by: microbial load of the source of infection (dead or contaminated objects), susceptibility of the host (health population) at portal entry of infection agent, and mode of transmission: droplet inhalation, contact via contaminated hands for COVID 19 virus placed into mouth, nose or eyes, [22], autopsy contaminated mortuary instruments or equipment, utilization of defective NPIs that mal transmit infection to health-care providers, [23,31]. Clothing, uniform soiled with infective microbes, Blood fluids split into the eyes, or mouth or another mucosal membrane during operation. Breakage into skin to cause a direct contact of microbes into body, [32,33].Thus the need for advocating for machinery arterial embalmment to enable safe handling of COVID 19 fomites and deaths, and manipulate for disposal and dissection, [32,34]

2.3.1 Health risks associated with COVID 19 cross infections during autopsy

Safety procedures attributed with handling COVID19 disease are consistent with those used to execute autopsies, [23]. Lungs and other vital organs of COVID-19 dead may still contain live pathogens, thus additional respiratory protection is needed during aerosol-generating procedures like generate small-particle aerosols using oscillating machine or washing of intestines during the autopsy [23,35]. Postmortems are done in an adequately ventilated room with natural ventilation or using electrical mechanical ventilations. Only a minimum number of staffs should be involved in autopsy procedures, [36]. Pathologist active in dissecting body and the two technical staffs cleaning and passing instruments to avoid cross contamination, [23,19,26]. Appropriate NPIs must be available, such as scrub suit, long sleeved fluid-resistant gown, gloves and two pairs of surgical/ autopsy gloves), anti-mist goggles, and boots, respirator or N95 masks are worn against aerosol-generating procedures, [22,37]. Fresh disinfectants with label claims against emerging viruses on autopsy table, [39], Instruments used during the autopsy should be cleaned and disinfected immediately after the autopsy, [19,38,39]. Environmental surfaces, where human remains are prepared, should first be cleaned with soap and water, [40,32], or a commercially prepared detergent solution; After cleaning, a disinfectant with a minimum concentration of 0.1% sodium hypochlorite, [20] or 70% ethanol should

be placed on a surface for at least 1 minute before you commence scraping and mobbing, using appropriate NPIs, for respiratory and eye protection, [41,25]. After end of autopsy dissection, the autopsy kits, bench, autopsy room after dissection and all material and items classified as clinical waste must be decontaminated in 0.5% hypochlorite and phenol solution then disposed properly according to legal and OSHA requirements,.(Red/black or Yellow liners) or incinerated, [23,29].

2.3.2 Machinery arterial embalmment for sustainable primary prevention in COVID corpses

Modern machinery arterial embalmment practices aims at enabling and advocating for various traditional cultures, customs and religious traditions to be accorded with holistic dignities required during disposal and dissection as distinct educational tool in medical schools. Embalmment practices ensure of complete efficacy and reliable safe handling of the associated COVID 19 dead for prolong periods as they remain safe with infection prevention and control interventions, [41]. If infectious corpse which are not buried within 48hrs, service providers are encouraged to use complete NPIs during decontamination process before any handling and transportation is executed [22,30]. Hasty disposal of COVID19 deaths should be avoided and management should manage each situation on a case-by-case basis, balancing rights of the family cultural values and the need to investigate the cause of death and the risks of exposure to infection, [33]. The infective corpse must be planed for arterial embalming to allow viewing or if not embalmed, COVID 19 body should be disposed immediately without viewing or kissing, [30,42].

Machinery arterial Embalmment, act as preservatives, sanitizes and disinfectant thus a model of safe infection prevention control, [15,16,43]. Embalming fluid contains a mixture of phenol, formaldehyde, Sodium chloride, eosin yellow,/ glycerol, methanol, and sodium laury sulphate , sodium citrate and oil of winter, concentrations are constituted based on case to case basis of corpse, [16]. Observation studies from the study region opined that over 98% of mortuary facilities could not prepare and sustain these arterial fluid, because they were neither trained as professional embalmers nor the facility could afford to sustain the complete ingredients set for embalmment, [40,16,10]. Since toxicology is rarely requested on suspected COVID 19 human remains, it is highly recommended to embalm and leave the body for 7 days before one request for autopsy dissection during the pandemic. Do not remove any inserted equipment from the body such as infusion fluid tubing, endotracheal, or other tubing or implant, electro-metal devices for 7 days after embalmment, to reduce health risks of disease transmissions. Synergistic participation of mortuary service providers with hospital administrates to influence safe infection prevention and control. WHO 2015 recommended regular decontamination of mortuary premises and postmortem benches, before cleaning and never spray or fumigate infectious pathogens on human beings with disinfectants because we have no scientific proof of evidence to ascertain any disease control, but just a waste of health resources, [30,33].

2.3.3 Chemical ingredients for embalming corona corpses

Embalmment fluids, enable and advocate for safe environments and public health of minimal or no risk, harm or fear when handling COVID19 associated corpse, the fluid ensure preservation of the whole body in a ''life like manner'' disinfect, prevents putrefaction action of bacteria, and autolytic action of the Cathepsin enzymes, [30,44], fluid also prevent contamination by insects and maggots development. Besides restoring dead cells and organs, to improve COVID 19 hygiene and sanitation [2,11]. The aims of embalming corpses for cadavers is to retain their anatomical architecture for dissection, as distinct educational tools in medical schools, [34]. Embalming also prevent desiccation, and inhibits fungal and bacterial growth hence retarding the growth of the potential pathogens. Embalmment fluid is basically constituted using ingredients' of preservatives, germicides (disinfectants), modifying agents buffers, surfactants (wetting agents), anticoagulants), dyes and water as the main vehicle, [45,46].The major ingredients of embalmment's are tabulated in Table 1 below and SOPs for embalmment in (*Appendix 1*).

Table 1. Distribution of arterial fluid ingredients based on specific mode of action on topical and insitu

Serial No.	Arterial Ingredient	Mode of Action
1	Formaldehyde (37-40)%	Preservative and fixative cells firm and life like manner and coagulates blood, [43]
2	Gluteraldehyde	React with proteins in wide range of PH, Disinfectants of virus and spores, [47].
3	Alcohol	Bactericidal and Bacteriostatic of vegetative pathogens, effective on viruses, fungi, mycostics, [2]
4	Anticoagulants Sodium citrates	Preservative airy salts, inhibits growth of clostridium botulism, Preserve color of cells,
5	Phenol crystal	Disinfectants and bacteriostatic at 0.2%, fungicidal and bactericidal at 1.5%
6	Buffers: sodium borate, magnesium bicarbonate	Maintains PH of dead at 9.0, prevents growth of molds, and bacterial decomposition [45].
7	Humectant and wetting agents	Glycerol soften tissues by allowing only little formalin to enter cell each per time.
8	Surfactant agents	Make tissue to stretch like a skin hide e.g., Sodium lauryl sulphate, [46].
9	Anticoagulants	Dissolve blood clots along blood vessels to influence efficiency embalmment Pressure: sodium citrate and sodium oxalates. Control iron s in tissues [46].
10	Hypochlorite	Viralcidal, 0.5% v/v, or 1.4% w/v with sodium hypochlorite, or calcium hypochlorite,[45]
11	Tissue cell dye	Eosin yellow powder, improve the role of restorative science [2].

2.4 Preparation of COVID 19 Corpses into Cadavers

Human cadaver is classified as a distinct educational tool of non-vital morbid and mortal variable of 3-dimensional: individual physical, psychosocial and social demographic, prepared using neat embalmment fluid and left for over 6 month shelf life, to achieve the mummification which turns protein into resin like sponge material and reduced health hazards exposed to medical students when dissecting [48]. One of important prerequisites for utilization of corpse in educational settings is by candid use of neat freshly prepared embalmment fluid and enabling faster mummification and conversion into cadaver for dissection, [17,18]. The preservation is appropriate, when COVID 19 cadaver is kept safe from harm, destruction or decomposition. Preservation is an action to keep infective corpse safe from harm, destruction and decomposition. Conservation is a process of careful preservation and protection corpse for dissection, while embalming is disinfecting and treatment of dead body with special neat or diluted chemicals/ arterial fluid to protect it from postmortem changes: autolytic and petrification processes , pathogen transmission, [48,34,43]. Basic chemical constituted arterial fluid are tables in *Table 4.1 above*, include: methanol, formaldehyde, phenol crystal, glycerol, sodium chloride, sodium citrate, sodium laury sulphate, and sodium hypochlorite for topical disinfections, which are constituted based on case analysis, and volume to surface area ratios of the corpse, [49,46]. Dissection of Cadavers is critical in development of human anatomy and pathology relations in clinical management of diseases. While morbid anatomy requires opening of the corpse to study in its relation with the clinical history provided, [34].

2.5 Quality Occupation Safety and Health Act (OSHA) and NPIs in COVID 19 Red Zones

Occupation Safety and Health Act (OSHA) requires that employers furnish to all employees with a package of employers free from recognized hazards that are likely to cause death or physical harm at place of work. Epidemiological organs are infectious pathogens that are of health care interest such

COVID 19 virus. [25], (OSHA) also states that the employer must access the workplace of their employee with a risk management plan to determine kind of hazard that are present then decide on appropriate NPIs to protect employees in both red and Blue zones, [22]. A risk management plan is a document that a project manager prepares to foresee risks, estimate impacts, and define responses to risks. It also contains a risk assessment matrix. NPIS are supplied based type of job task assigned to employees. Main NPIs required when handling communicable diseases such as Ebola and COVID 19 pandemic are: Nitrite gloves, puncture resistance, anti-mist goggle, or face shield, fluid resistant or impermeable gown, overall and aprons, [22]. Face masks must cover both nose and mouth, dedicated washable shoes, with protective shoe covering, N95 respirator, and room powered by air purifying respirator, [4]. NPIs are used to minimize the risks of skin and mucus membrane contact with potentially infective dead and fomites. Decontamination of NPIs, after use may controls self-contamination [33,50].

It's vital to limit the number of service provider to handle infectious body to minimize exposure rates for example during embalming only two technicians are enough so that one active in handling the case and the second cleaning and passing instruments, [49]. This will avoid cross contamination of the work area, after remove or change of gloves you must wash in antiseptic or soap in running tap water. When clothes are soiled with infectious waste, remove and shower immediately, [29]. When doing a procedure wear a dedicated washable footwear. If exposed to potential infectious material notify your supervisor [53]. COVID 19 corpse may have the best viable anatomic structures, [17,18], which are intact for dissection because none of organs that caused death is likely to re-infect after long period of mummification. Studies indicated that COVID 19 corpse buried none embalmed when left for long period are reduced to skeleton with limited health hazards of transmission, except case of anthrax which may be still potentially infective even when handling infected bones, [39].

In mortuary and forensic science handling of infective corpse must be executed with a well-trained personnel, good observers, must wear correct NPIs, any soiled surfaces , equipment and patient care surfaces must be decontaminated immediately in 0.5% sodium hypochlorite, before disposed in Red liners(biohazard bags), [30,51,11] Disinfection executed using freshly prepared embalmer disinfectant which is a. mixture of freshly prepared Phenol crystal, 0.5% sodium hypochlorite aquas or 14% calcium hypochlorite granules, and methanol dissolved in tap water to form sanitize and disinfectant against infectious pathogens on the corpse and fomites, [47,43].

Transportation of COVID 19 corpse, needs to use double disposal gloves, with extended cuffs, with long sleeved disposal gowns, and avoid transportation repatriation of non-embalmed infective corpse for long distance journey, or non-cremated by aircraft, coordinate with the state authority in advance to avoid delays, protect the corpse with Blue / cold zone from the hospital, waiting final disposition, [4,52]. Use pre identified hearse by the public health officer among the burial team in advance to accompany infective corpse with Red liners to ensure safety disposal and decontamination of area after completing the disposal services, [32,14]. Anyone handling body bag must wear double disposal gloves, disposal gowns with extended cuffs and long sleeved, never open the casket if the body was not embalmed by modern embalmment, all embalmed bodies should be allowed to be buried based on the culture customs and religious traditions of specific community which may vary from community to community. Before an autopsy examination or embalming mortuary service providers should wear eye protection, mask, gowns anti mist goggles, and N95 respirators and switch on mechanical ventilators to extract and supply in fresh air, [53,4,27]. Histological specimen should be fixed immediately into 10% buffered formalin and left for 14days tissue processing and staining in Haematoxyline, [23,52,44].

2.5.1 Disposal of COVID 19 corpses

MOH has obligations and duties to protect the health of burial, crimination and exhumation teams besides the whole community from contracting COVID 19 associated risks of transmissions from the dead, by advocating for compulsory arterial embalmment to influence dignified burials, finance funerals and amicable integration of the specific cultural rites and religious traditions mediate for any future possible exhumation that may arise due to cultural conflicts of interest during or after disposal, [15,40,9,54]. Family members should be allowed to participate in burials arrangements of COVID-19

cases. Synergistic participation does not compromise infection prevention and control measures. Involve and engage the community to enhance faster healing and reduce psychological stigma associated with COVID 19, [445]. For any health successful approach in the community, the strategy may adapt traditional burials nested within customs of the wider community engagement, empowerments, and health communication to enable understanding of community for sustainability safe infection prevention and control measures. Failure of social collaboration and public research may results to exhumations. Exhumation are done based on local and national guidelines and level of transmission virulence, [40,54]. Thus never accept to exhume none embalmed infectious body due to failure to follow cultural and religion traditions or dissection and research. When dealing with recently dead or old buried and exhumed for autopsy or proper reburial reduce infection rate by covering cuts or lesions with waterproof dressing. Rinse any injury in running tap water and practice good personnel hygiene. Main clients of corpse during dissection or autopsy are medical students, pathologist, anatomist, medical doctors, nurses, embalmers, morticians, funeral directors, forensic scientist, and religious leaders, [4,55].

Fig. 5. Disposal of COVID 19 corpse by Public health team without Involving Next of kins, April (2020): source [56]

Fig. 5 Demonstrates main subjective indicators attributed to limited synergistic participation of MOH in disposal of COVID 19 corpse without collaborating with community cultural and religious rite. Hence results to cool night plans of exhumations in the absence of County /security administrations, in the study region [56].

3. METHODS

3.1 Study and Sampling Designs

The study designs was descriptive cross sectional and longitudinal cohort designs of mixed approaches, while sampling design were, prospective, retrospective. Quantitative data was collected by survey using semi structured questionnaire, Qualitative data was collect though interviews using KIIs and FGDs guides and observation using 3Ls, during community diagnosis and transect survey mapping.

3.2 Sample Size Estimation

Sample size of 153 respondents from both facility and Community Home Based Care units of COVID 19 survivors, warriors and health population sampled followed retrospectively to monitor and evaluate effectiveness of 100c^{o} COVID 19 steaming cycles in fermented green tea leaves, [6,7,57], The study also explored on regional and global observational mass data, (3Ls) on global impacts of COVID 19, and purpose random sampling designs to provide inferences, Target population was achieved by picking Yes and No as inclusion from study population. Research assistant were trained by principal research to ensure quality data collection.

4. RESULTS AND FINDINGS

4.1.1 Demographic characteristics of COVID 19 mortalities in the study region

Five demographic variables were evaluated in relation to COVID 19 morbidity and mortality in the study region, included: Gender : male/ Female, Age cohorts, Marital status, level of education achieved, and religion of the household affected with COVID 19 deaths. Majority of the findings, 53%, of participants demonstrated that COVID 19 deaths are highly significant with older cohorts (56 yrs. and above), with P values of 0.34, achieved highest level of education and married. Most participants opined:

> *''100c^{o} COVID 19 steaming cycles in fermented green leaves work very effective and contain viable cure on COVID 19 disease among the elderly and adult cohorts though MOH does not recognize it as an alternative medicine in addition to the uptake of dietary vitamins c booster nutrients, such as ginger lemons and garlic regular intake as Primary prevention during Pandemic. KII discussed with Facility in charge in the study region'' June, 2020*.

> ''*In fact MOH due to its attributed convention knowledge on curative medicine and practices, may call dietary intake to supplement body immunity for primary prevention better than cure as concoctions. This was noted during a national media briefing on COVID 19 updates by MOH in May 2019.''However Dr, the only challenge with steaming is the challenge on accessibility of fermented green leaves incases of confirmed cases with COVID 19 in early clinical diagnosis. KII informant with one of COVID 19 survivors.'' June, 2020.*

The COVID 19 endangered cohorts are classified by the community health to be associated with high social economic status and employed in education, health, engineering and Agricultural sectors, compared to the marked low mortalities realized among the same older cohorts of self-employed population in rural homes, middle income earners and low income earners of other cohorts of above 35years living in urban slums and rural habitats. COVID 19 mortality by gender, the findings indicated more men 67%, (100), succumb to COVID 19 disease than female 33 %,(50) may be due higher immunity and less stimulation of angiotensin-converting enzyme 2 (ACE2) by the infested female lungs with COVID 19 disease.as indicated Fig. 6 below.

4.1.2 KAP of health service providers on machinery arterial embalmment

Study results knowledge attitude and practices of health service providers on prompt arterial embalmment of COVID 19 dead as safe model of infection prevention control opined that majority, 98% (150) of COVID 19 deaths were neither disinfected nor embalmed as stipulated in ICCFA, embalmer manual of 2020, on safe infection prevention and control protocol applications before disposal and cadaver's dissection as distinct educational tools.

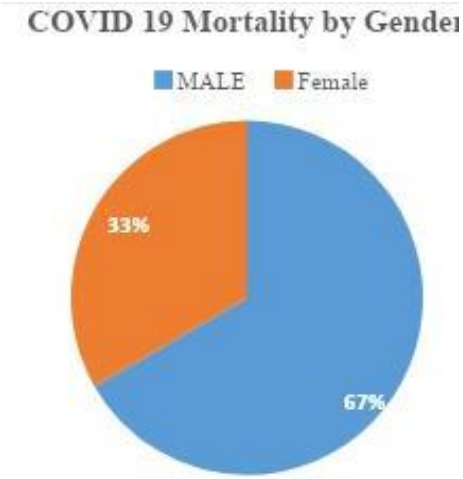


Fig. 6. Pie chart demonstrating how more male are affected with COVID 19 mortalities compared to female gender living in the same settings

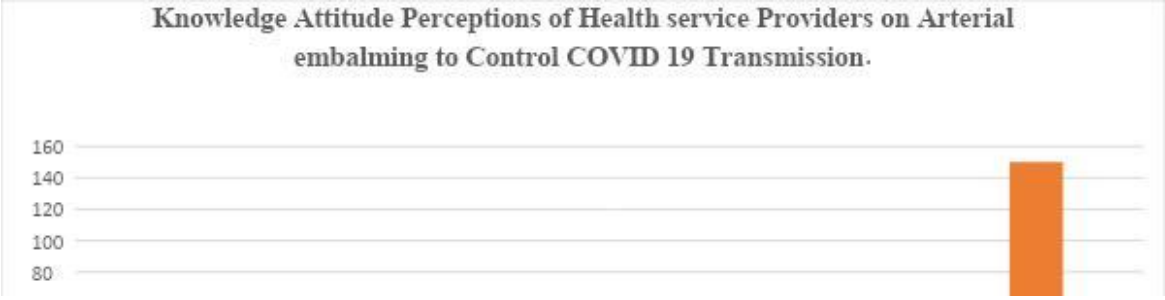


Fig. 7. Above demonstrated a skewed number of COVID 19 dead embalmment in early pandemic months

The associated limited KAP of service providers on embalmment and disinfection of COVID 19 human remains, remain a major challenge in the fight against infection prevention and control of Corona virus among population health with attributed health risks of OD 6.7 and RR (6.7, 7.7), between the health burial team and population health respectively. Consistence failure of MOH to instruct compulsory embalmment of COVID 19 deaths was attributed to misinterpretation of the interim directives from global health protocols on safe handling of the confirmed or suspected COVID 19 deaths, which is social genocide to many African cultural practices and religious traditions, because COVID burial team from MOH, lowered dignities and last respects approaches normally accorded to the deceased and creating prolonged psycho social community stigma, besides the noted planned calm night exhumations after 2 weeks of burial, that exposed the community health both health hazards and risks of OD 6.7, RR (5.6, 7.7).

> *"Some Bukusu elders warned against exhuming bodies of people who had succumbed to Covid 19 and reburying them in line with local cultures and traditions. One of the parish priests lashed out at families who allowed exhumations to happen, terming the act as health hazard and health risk to community health. It was said that some families exhumed COVID 19 body of their relatives to secretly rebury them at night.*
>
> *The rationale of calm night exhumation was that, they believed that the dead were resurrecting at night and haunting life relatives, demanding them to execute a dignified send off in line with Bukusu culture and customs. Whereby, a dead person was supposed to be buried after certain rituals are performed on his or her body, like not burying with ties as it will strangulate the deceased, or lie on left lateral side facing where Sun sets, and never buried with pair of shoes as it will hurt them and they will never rest in their internal journey, which was never done by health*

burial team who came in white gowns and gloves' thus why community and next of kins opted for night exhumation which was said to dearly expensive procedure". KII from a Bungoma based priest who warned the specific community May 2020 and discussants with Bukusu Elders.

The uptake of NPIs in Red zones was low and ill advice by MOH to population health, thus only 15% had a proper uptake of NPIs with insignificance OD ratio of (1.0), with RR (2.3, 2.3), since MOH did not enable, advocate and mediate with other collaborators candidly on when and where to use NPIs between the Red and Blue zones, which were never defined by MOH. Though the application of 6 feet social/physical distance, was socially marketed in mass media its practical application in various demographics remain skewed and unachievable with only 15% uptake (23 respondents). However hand washing was greatly acknowledged with over 65% uptake (100 respondents) and in average uptake by the entire population health, thus influence a marked lower prevalence of diarrheal diseases like cholera and typhoid during the COVID 19 pandemics as witness in number of FGDs triangulated in depths interviews.

"Since the COVID 19 pandemic started we have not realized any serious challenge and complications associated with of cholera dysentery or typhoid in our community nowadays Daktari (Dr.)…. in fact most clinics in our community have been closing up because they are lacking patient / cases to treat hence they unable to pay rents of their premises so even when corona / COVID 19 ends up let us continue to wash our hand daily and impress hygiene" FGD discussants in Vihiga Migori Trans nzioa County facilities June 2020.

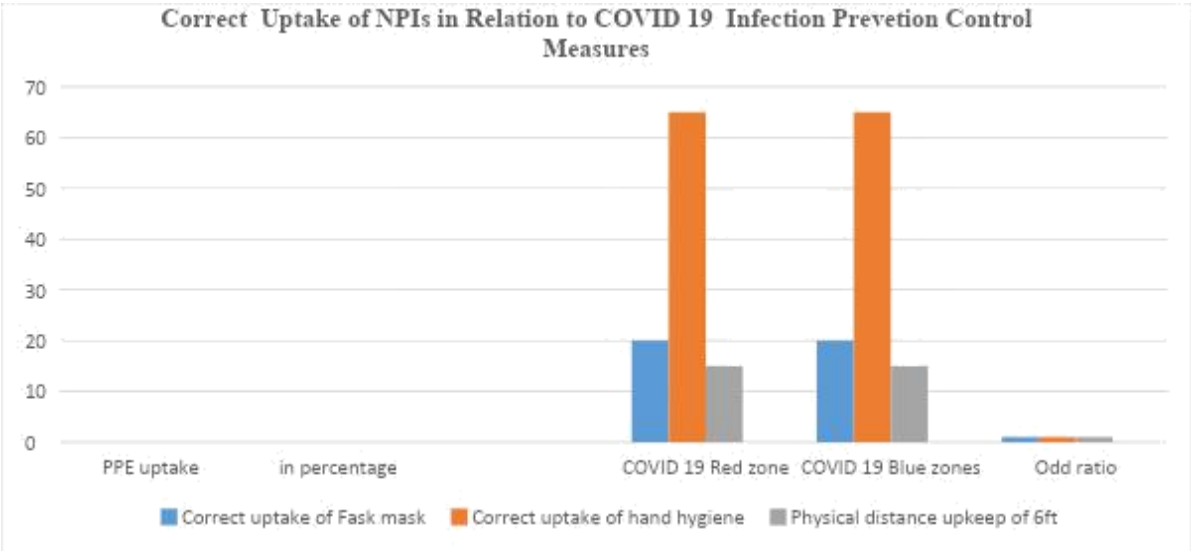


Fig. 8. Above demonstrates mains subjective attributions related to safe uptake of NPIs in COVID 19 as a primary prevention

Majority of the respondent, 76% (116) respondents, knew that infective COVID 19 dead could transmit infection. But only 24% (37) respondents knew that COVID 19 dead were airborne, thus hard to transmit infection because they were not breathing by time of dead.

Table 2. Modes of COVID 19 Transmission between the Pathogen and Susceptible host (population health)

Ways of Direct transmission COVID 19 in Community	**(%)**	**Ways of Indirect Transmission of COVID 19 in Community**	**(%)**
Airborne droplets inhalation	24	Breathing contaminated COVID 19 droplets	24
Contact of fomites	76	COVID 19 Soiled hand contact Face and eyes	76
Total	**100**		**100**

Further findings demonstrate that mode of COVID 19 advocacy to population health on health education, health communication and public health research were limited towards vertically communication, orders were only from MOH, with limited or no synergistic participation in the sector wide approach (SWAP), thus lacked blended approaches of health promotion interventions on COVID 19 health behavior change in the society, as marked with very low or limited implementation and community empowerment of COVID 19 concepts, as opined in many. KIIs and FGDs discussions with insignificant implementation of COVID 19 protocols on safe infection prevention controls, thus why Nation Police service acted on obedient civilians, at one time the country behaved like being manned Police state, which was clearly mentioned and stated in number of FGDs, and KIIs, from Trans Nzioa, Kakamega, Bungoma, Busia, Vihiga, Eldoret Moi, Kisumu, Homabay, Migori and Siaya counties, who said candidly that:

> ''*Our fellow people were being clobbered by Police service for not adhering to curfews and lockdown restrictions and timings' "FGD discussion held in Bunguma, Kitale, Eldoret and siaya, June 2020"*

4.2 Knowledge, Attitude, Awareness on Embalmment Practices to Influence Safe Infection Prevention Control in COVID 19

Table 3. Utilization of machines and gravitational embalmment for safe disposal and dissection

Facility Uptake and Method of Embalmment	Modern Machinery	Gravitation Method	Knowledge and awareness on COVID 19 Steaming	Knowledge & awareness on COVID 19 Steaming cycles in Fermented Green tea leaves	Hygiene level, on Ritchers scale: 9, very clean, 4.5, clean and 1, not clean
Kitale tier 4	NO	YES	YES	NO	4.5
Moi referral level 6	YES	NO	NO	NO	9
Bungoma tier 4	NO	YES	YES	NO	4.5
Kakamega level 5	YES	NO	YES	NO	9
Busia tier 4	NO	YES	NO	NO	4.5
Vihiga tier 4	NO	YES	YES	NO	1
Russia level 6	YES	NO	NO	NO	9
Kisumu tier 4	NO	YES	YES	NO	4.5
Migori	NO	YES	YES	NO	
Homa Bay tier 4	NO	YES	YES	NO	
Siaya tier 4	NO	YES	NO	NO	1

The Table 3 above demonstrated that only 27% of mortuary facilities in western Kenya, like the population health may be aware on how the modern machinery arterial embalmment influence safe infection prevention control in COVID 19 deaths compared to gravitation methods where by most (73%,) of facilities utilized is as embalmment method of choice. Likewise majority 88% (135) respondents were not aware on the correct constituent ingredients that forms Embalmer / arterial fluid, to enable safe infection prevention and control transmission mainly: Formaldehyde/ glutaraldehyde, phenol, sodium citrate, sodium laurysulphate, glycerol, methanol, methyl salicylate, sodium chloride, Sodium borax and eosin yellow. Most respondent knew only formalin has a drug of option in embalming. Only Kakamega, Russia and Moi referral and teaching, facilities executed modern machinery arterial embalmment, but with only one or two ingredients specifically formalin, due to limited resource. Lastly, 6 feet physical/social distance application was insignificant with P value of 13.6. *We only use formalin to embalm because of the limited resource to purchase other reagent if given money we will buy and utilize it Darktari" FGD discussant in Kakamega facility morgue in August 2020.*

5. DISCUSSION

Collaborated Knowledge, Attitude and Perceptions of health service providers on alternative medicine, arterial embalmment during pandemics, provide efficiency model for sustainable infection prevention control of communicable diseases such as COVID 19 disease and associated deaths in western Kenya which still remain low and skewed, contrary to study by (46, 54), on quality infection prevention and control, community participation medico legal concepts to identify unclaimed or missing dead bodies, embalm and improve public health. Machinery arterial embalmment form cradle instruments for safe infection prevention control before disposal and cadaver dissections as distinct educational tool in medical school, which are in line with study by (7, 57), on embalmment as a better option for safe practical approach to enable cultural and religious traditions to be executed on COVID 19 deaths without health risk exposures as opined by the study by, (54). Health education form vital approach for functional health promotion interventions on COVID 19, to enable, advocate and mediates on the prompt need of arterial embalmment utilization of NPIs, through health behavior change to influence safe infection prevention control and synergistic community implementation a study in line with (40,54). However the uptake of NPIs in study region were contrary to the laid out interim guidelines from the global health COVID 19 protocol (47), due to limited utilization of health promotion intervention approaches for gradual health behavior change among population health, as demonstrated by many National police service personnel clobbering innocent citizens due to claimed incorrect uptake NPIs, as a criminal offence, These were noticed in a number of observation surveys, FGDs and KIIs complains by participants for being forced to pay fine if found wearing face masks on mandible or on the occipital head, which was never demonstrated during health education forum for community to action to influence health behavior change on proper NPIs uptake as approach of COVID 19 health promotion intervention.

Safe disposal humans' remains for burial, cremation or cadavers' dissection as distinct education tool in medical school were completely prohibited in the global interim guideline of handling COVID 19 pandemic, hence all burials were strictly executed by "*public health burial team*", within 48hrs of death, without any form of embalmment and disinfection. Communities identified the burial team from MOH, as "*Men in long sleeved white gowns boots and gloves with mortuary gadgets*", whose roles in health service provision were contrary to study by, (2, 10, 22, 46, 53,). on quality embalmment approach as the key primary prevention concept for safe disposal and Cadaver dissections of COVID 19 humans remains, safe and limited or no community transmission.

MOH often planed burial/ cremation in the study area without synergistic involving the next kins' to factor in their cultural, religious traditions rites and influence dignified burial ceremonies. The negative effects of limited family participations in burial arrangement during COVID 19, was closely associated with several night planned, calm exhumations of COVID 19 related dead as witnessed in Bungoma and Siaya Counties. Most burials were organized by *''the Public health teams''* who candidly executed disposal against the Community cultural customs and religious rites. Likely also against the studies and global protocols by, (17, 53, 57, 58), guideline on disposal of COVID 19. Also human remains exhumation at night time was contrary to study by (46), on roles of DNA in Identification of human remains in western Kenya using comparative standards and roles of embalmment by (2). Thus the timely need for global health to enable advocate and enhance mediation strategies for health promotion intervention, towards health behavior change for impressing primary prevention better curative service on COVID 19 case, besides further studies on safe infection prevention control of COVID 19.

6. CONCLUSION

Steaming at 100^{o}C COVID 19 in fermented green tea leaves regular intervals may enable primary prevention from attributed COVID 19 mortalities. Safe disposal and cadavers dissections of COVID 19 deaths as distinct education tools in western Kenya, remains low and skewed as per the (57), recommendations on COVID 19 protocol and authors observational expectations due to limited uptake of comprehensive and holistic Community empowerment in the society on good health promotional approaches: social mobilization, community empowerment, quality COVID 19 advocacy in context of Kenyan scenario, health education, candid health communication and synergistic social

marketing on of effect of COVID 19 disease and deaths, to enable efficiency primary prevention on safe infection prevention control with enhanced sustainable uptake NPIs by the older cohorts with higher risks to contact. COVID 19, which is primary a public health problem. When COVID 19 disease progress to secondary stages one develop severe pneumonia, dyspnea with sudden drops of blood pressures due to septic shock hence a medical problem now, thus the patient needs intensive care unit ICU, machines to supplement oxygen in body. Government should focus on primary prevention and advocate for palliative supplement of Vitamin C, D dietary. Mediate for compulsory arterial embalming before disposal or repatriation of COVID 19 dead, and encourage health education and advocacy of quality uptake of PPEs specifically N95 among the older age who are at high risk for COVID 19, to influence equitable universal health care by 2030.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Hung C, Wang Y, Li X, Ren L, Yhao J, Hu Y, et al. Clinical features of patients infected with 2019 coronavirus in Wuhan, China. Lancet; 2020.
2. Pereira SSP, Oliveira HM de, Turrini RNT, Lacerda RA, et al. Disinfection with sodium hypochlorite/ calcium hypochlorite in hospital environmental surfaces in the reduction of contamination and infection prevention; 2015.
3. Silali MB. Factors Associated with Low Virulence in the Infective COVID-19 Virus in Africa with the Pandemic infection Rise. Acta Scientific Medical Sciences. 2020a;4.4(2020):130-134.
4. CDC, in Atlanta. Symptoms of coronavirus. Atlanta: Centers for Disease Control and Prevention; 2020.
5. Cheung KS, Hung IF, Chan PP, Lung KC, Tso E, Liu R, et al. Gastrointestinal manifestations of SARS-CoV-2 infection and virus load in fecal samples from the Hong Kong cohort and systematic review and meta-analysis. Gastroenterology. 2020;159:81–95.
6. Afonina SN, Lebedeva. Successes of Modern Natural Science; The chemical components of tea and their influence on the organism. Scientific Journal; 2019.
7. US National Library of Medicine. Steam Inhalations in COVID-19 Patients (Steam-COVID-19); 2019.
8. YL Ling, JK Lin. Molecular pharmacology, – ASPET Nitric oxide (NO) plays an important role in inflammation and multiple stages of carcinogenesis. We investigated the effect of various tea polyphenols and caffeine on the induction of NO synthase (NOS) in thioglycollate-elicited and lipopolysaccharide (LPS); 1997.
9. Calverton M. Demographic Health and Survey, CBS and ORC Macro Ministry for Public health and sanitation, Nairobi Kenya. 2009;114-119.
10. Global Map. John Hopkins University, corona virus resource center; 2020.
11. World Health Organization, Geneva. Decontamination and Reprocessing of Medical Devices and equipment for Health-care Facilities; 2020a.
12. Mills PR. Preparation and presentation of Anatomical specimens at the University of Sydney; 2010.
13. Rutala WA, Weber DJ. Best practices for disinfection of noncritical environmental surfaces and equipment in health care facilities: A bundle approach. Am J Infect Control; 2019.
14. Vita-Finzi L, Campanini B. Working together for health to improve infection prevention and control in population health; 2006.
15. Ajman ML. Embalming: Principles and Legal Aspects of embalming human remains, Jaypee Brothers Publishers; 1998.
16. Bedino JH. Embalming Chemistry: Glutaraldehyde versus Formaldehyde. Champion Expanding; 2003.
17. Cunningham. The Kinds of human Anatomy, Medical History and dissection. 1986V;1,2 and 3:1-19.
18. Cunninghsm, Manual practical of Anatomy 16th edition. 2018;3.
19. Royal College of Pathologists (UK). Autopsy practice relating to possible cases of COVID-19 (2019, novel coronavirus from China 2019/2020); 2020.

20. Rutala WA, Weber DJ. Uses of inorganic hypochlorite (bleach) in health-care facilities. Clin. Microbial. Rev. 1997;10:597–610.
Available:https://doi.org/10.1128/CMR.10.4.597
21. Moa D, et al. Guide to forensic pathology practice for death cases related to coronavirus disease (2019), (COVID-19) (Trial Draft). Forensic Sciences Research. 2020;5(1).
22. Tan SWX, Chia YK, Lee PY, Ng TH, Wong OT, MSY, et al., Air, Surface Environmental, and Non pharmaceuticals Interventions NPIs Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)/ COVID 19 from a Symptomatic Patient. JAMA. 2020;323.
23. Hanley B, et al. Autopsy in Suspected COVID-19 Cases. Journal of Clinical Pathology. 2020;73:239-242
24. Funeral Consumers Alliance. Dead Bodies and Disease: The "Danger" That Doesn't Exist; 2011.
25. Koh D. Occupational Health risks for COVID-19 infection. Occupation Med. 2020;70:3–5.
26. Ramesh N, Siddaiah A, Joseph B. Tackling corona virus disease 2019 (COVID 19) in workplaces. Indian J Occup Environ Med. 2020;24:16.
27. World Health Organization. Modes and Sources of transmission of Virus causing COVID-19: implications for IPC precaution recommendations; 2020f.
28. Silali MB. 21 Days of Social Synergistic Pilot Survey on Community Participation to Determine the Level Virulence of COVID-19 in Africa before Re-Opening of the Education Sector in an efficiency, Affordable and Sustainable Approach". Acta Scientific Medical Sciences. 2020b;4.7(2020):47-48.
29. Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with bactericidal agents. Journal of Hospital Infection. 2020;104(3):246-51.
30. MB Siali. Health Determinants Of Safe Infection Prevention Control Of COVID 19 Deaths To Enable Safe Disposal And Cadavers Dissection As Distinct Educational Tools In Western Kenya; 2021a.
31. Morawska L, et al. Airborne transmission of SARS-CoV-2: The world should face reality Environmental International. 2020;139:105730.
32. CDC and ICAN. Best Practices for Environmental Cleaning in Healthcare Facilities in Resource-Limited Settings. Atlanta, GA: US Department of Health and Human Services, CDC; Cape Town, South Africa: Infection Control Africa Network; 2020.
33. World Health Organization, Geneva. Infection prevention and control for the safe management of human remains in the context of COVID-19: interim guidance; 2020c.
34. Humphrey DC. Dissection and Discrimination: the Social Origins of Cadavers in America; 1987.
35. Lacy J, et al. COVID-19: Postmortem diagnostic and biosafety considerations. American Journal of Forensic Medicine and Pathology; 2020.
36. WHO. Geneva. A primer for mainstreaming health promotion. Working draft for The Nairobi Global Conference on Health Promotion, Kenya; 2009.
37. Tan SWX, Chia YK, Lee PY, Ng TH, Wong OT, MSY, et al. Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)/ COVID 19 from a Symptomatic Patient. JAMA. 2020;323:1610.
38. World Health Organization, Geneva. Natural ventilation for infection control in health-care settings; 2009.
39. World Health Organization. Infection Prevention and Control during Health services when COVID-19 is suspected or confirmed; 2020d.
40. Bennett JE, Dolin R, Blaser MJ. (Eds.), principles and practice of infectious diseases at facility setup, Eighth edition Elsevier/Saunders, Philadelphia, PA; 2015.
41. Burden B. Centers for Disease Control and Prevention Atlanta, Georgia, as quoted in Mortuary Management magazine; 2006.
42. Morgan O. Infectious Disease Risks from Dead Bodies Following Natural Disasters. RDivision of the World Health Organization; 2004.
43. De Groot AC, Flyvholm M-A, Lensen G, Menné T, Coenraads P-J, et al. Formaldehyde-releasers: relationship to formaldehyde contact allergy. Contact allergy to formaldehyde and inventory of formaldehyde-releasers. Contact Dermatitis. 2009;61:63-8.

44. Silali MB, Odero W, Rogena E. Roles of DNA Molecules in Identification of Unclaimed or Missing Dead Bodies Presumed Death in Western Kenya Utilizing Comparison Standards. J Foren Path. 2017a;2:106.
45. Mayer R. Embalming: History, Theory, and Practice, Fifth Edition, McGraw Hill NY; 2012.
46. McKone HT. Embalming—Chemistry for Eternity. Chem Matters. 1999;17:12-13.
47. Bedino JH. Phenol exposure in embalming rooms: part 1. Champion Expanding Encyclopedia of Mortuary Practices. 1994;621:2498-2500.
48. Brenner E, Maurer H, Moriggl B, Pomaroli A. The human cadaver as a distinct educational tool classification and comparison with other educational tools pg. 2003;185:229-230.
49. International Cemetery Cremation and Funeral Association ICCFA, Embalming SOPs for infective COVID 19 Human Remains; 2020.
50. World Health Organization. Infection prevention and control during health care when coronavirus disease (COVID-19) is suspected or confirmed: interim guidance, 12 July 2021. World Health Organization; 2021.
51. Silali MB, Odero W, Rogena E. Community Participation Medico Legal Concepts to Identify Unclaimed or Missing Dead Bodies from Public Mortuaries to Improve Public Health in Western Kenya. J Health Med Informat. 2017b;8:260.
DOI: 10.4172/2157-7420.1000260
52. Silali MB. Predictors of Advocating Safe Health Population When Handling. Sars-Cov-2 Morbidities To Enable Safe Disposal And Mediate Efficient Community Live Hoods; 2021b.
53. CBS. Population and Housing census for 2009, Ministry of Finance and planning Nairobi Kenya; 2010.
54. Fritz PS, Geneva, Getting's, Death, Burial or cremation the Individual with infectious diseases, pg. 1960;216—34.
55. World Health Education. Practical considerations and recommendations for Religious Leaders and Faith-based Communities on disposal in context of COVID-19; 2020g.
56. Star media, July, Culture before safety, Covid-19 human remains secretly exhumed, buried by Bukusu elders exhume, supervise the reburial of 2 bodies that were 'improperly' buried; 2020.
57. Ye G, Lin H, Chen L, Wang S, Zeng Z, Wang W, et al. Environmental contamination and decontamination of the COVID 19 in healthcare premises; 2020.

APENDICES

APPENDIX 1

100c^{o}Steam COVID 19 Inhalation in fermented Green Strong Tea to Improve Population Health.

Fig. 1. Demonstrates 100c^{o} COVID 19 Steam inhalation cycle concept in fermented /green Tea leaves to release Catechins to enable opening of alveoli. Most Viruses are killed by steam at 60c^{0} to 70c^{o}for 10 -15 minutes, [23]

APPENDIX 2

Green Tea leaves (Catechins & Theaflavins).

Fig. 3. Fermented Green tea in (Flavonoids) group contain catechins, when inhaled by COVID 19 patients helps to open alveoli of defected COVID19 lung, reduces fragility and permeability of capillaries, normalize human tissue respiration, prevent development of atherosclerosis and cancers since are antioxidants [6]

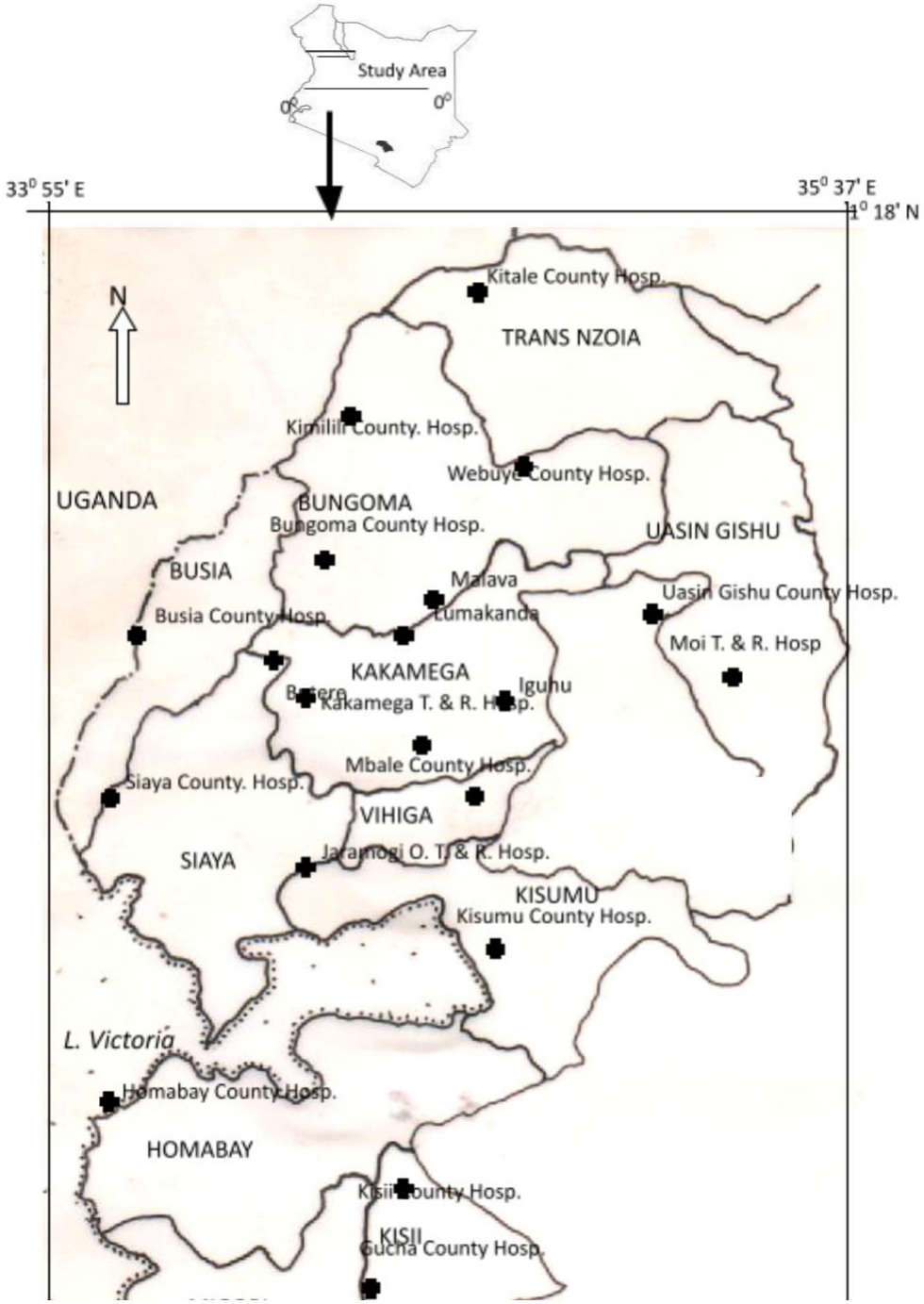
Fermented green tea leaves also release theaflavin that neutralize corona virus along respiratory system, Green tea leaves also contain theanine, a provitamin A-carotene, which provides a functional state of mucous membranes of the eye, nose, pharynx, larynx, respiratory tract [43].

APPENDIX 3

Standard Operating Procedure COVID19 Embalmment, (ICCFA, 2020).

i. Mortuary service providers must wear full PPE with N95 respirator or greater
ii. Preferably two technical staffs should be allowed in procedure room, one active in handling the embalming and the second cleaning and passing instruments mainly to avoid cross contamination of the work area
iii. Human remains must have facial area covered with a disinfectant soaked cotton cloth barrier before any manipulation and the entire remains must be sprayed down with disinfectant
iv. Human remains clothing and personal effects must be bagged and then double bagged in a way not to contaminate the second bag,
v. Human remains with retained facial area covered should receive a complete cleansing with embalmer's disinfectants, while adhering to "contact time" of at least 1hr the product to be utilized
vi. Provide a plastic see-through barrier should be placed over the entire head area to create second facial barrier. The facial area should be also disinfected and cleansed last.
vii. Clean eyes, nose, ears, mouth and throat using a strong disinfectant. Adhere to the contact time of the product. The plastic barrier must remain in place as you can work with your hands under the plastic at all times
viii. After the nose, mouth and throat are cleaned, place packing (i.e. cotton) with disinfectant into the throat and nasal area in attempts to completely occlude the passages from the throat leading to the nose and mouth
ix. Set features of the dead body accordingly
x. Raise vessels and prepare for arterial injection
xi. Mix an arterial solution into embalmment tank set and maintain pressure of the injector pump of 4 -5 Pascal throughout the procedure.
xii. Use a drain tube for your drainage to create a closed system between you and the blood discharged during the embalming. The horse leading off the drain tube should be placed down into the waste drain to prevent exposure to the blood as much as possible, (*there should be no free-flowing drainage down the table.)*
xiii. Begin your injection on a closed system (drain tube closed). A low rate of flow is suggested so you don't cause distention.
xiv. Allow as much injection to take place without causing distention or risking purge. Remember, the plastic barrier is still in place over the head and facial area.
xv. When you have injected a sufficient amount of chemical, turn the machine off and wait for 15-20 minutes to allow the chemical to work and accomplish as much disinfection as possible in the allotted time.
xvi. Begin injection again and open drainage to allow the release of pressure.
xvii. Perform topical embalming and intermittent drainage throughout the embalming process, allowing pressure to build and then release
xviii. Follow normal embalming procedures to ensure a well embalmed body (i.e. use more arterial chemical if needed per case analysis). Stop after arterial injection
xix. Wash and disinfect remains again (terminal disinfection)
xx. DO NOT aspirate the human remains from any body cavity for toxicology for a minimum of 24-hours after arterial injection

APPENDIX 4



Map 1. Western Kenya

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He is working as an Anatomic Technologist, Department of Human Anatomy, School of Medicine, Maseno University, Kenya. He was retired from Kenya Defense Forces Hospital. He Worked with Kenyatta National hospital as Mausoleum Manager cum Histopathology technologist, c. He is an Embalmer, Scholar, Fellow and Directorate of Forensic Science and Population Health with Lifetime Memberships from (IASR) in 2018. He Had Diploma in Medical laboratory sciences (MLS) and Higher National Diploma in Histopathology & Cytopathology, and Post Basic diploma in Health Service management and Administration, from Kenya Medical Training College, (KMTC) Nairobi, Kenya, 2007. He obtained his BCHD & MCHD degree from Great lakes University of Kisumu, Kenya, 2012, PhD degree from Maseno University, Kenya. He has a copy of thesis is filled with international library for thesis, 2019 which entitled ''Health Determinants Of Medico-Legal Approaches in Identification of Unclaimed Bodies or Missing Dead Persons from Public Mortuaries in Western Kenya to Improve Health. He is doing another PhD in Public health: Occupational Health risks and Medico legal procedures attributed to delayed Disposal of Unclaimed Bodies or Missing Death Persons (UCBOMDPs) in public mortuaries in western Kenya, in Masinde Muliro university of Science and Technology. He has 20 publish articles. His research interest is mainly on innovative candid Population Health and Forensic Sciences research and publications, for Health planning, Policy Development & Management. He has supervised a number of Bachelors & Masters Researches, External Editor in a number of renowned international journals. He Published 16 research papers, besides being the author of two published University Academic Books. He is part time lecturer in Human anatomy, Cell biology, histopathology and cytopathology in Maseno University, Masinde Muliro university of Science and Technology, and Kisii University, Kenya. He has attended various health related Conferences and symposiums locally and abroad, and has synergistically partnered with various Facilities and Academic institutions in various positions in the society. He is a known semantic scholar by the Google scholar of 2018.

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DISCLAIMER
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