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PRE- AND POST-IMPLEMENTATION OF A YOUNG FIRST AIDERS (YOFA) TRAINING PROGRAM AMONGST EARLY SECONDARY SCHOOL CHILDREN ON INJURY AND TRAUMA FIRST AID IN FAKO DIVISION.

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November 15, 2024

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LIST OF ABBREVIATIONS

ABBREVIATIONS	MEANING
CBT-LFRs	Community-based trained-LFRs
CoSTRs	Consensus on Science with Treatment Recommendations
CTR	Cameroon Trauma Registry
DALYs	Disability Adjusted Life Years
ERCFAWG	European Resuscitation Council First Aid Writing Group (ERCFAWG)
FA	First Aid
HD	Health Districts
IFRC	International Federation of the RedCross
ILCOR	International Liason Committee on Resuscitation
Km	Kilometers
LFR	Layperson first responder
LMIC	Low- and middle-income countries
LTB	Life Threatening Bleeds
MINSANTE	Ministry of Public Health
MoPH	Ministry of Public Health
OSHA	Occupational Safety and Health Administration
SBEAT	Stop the Bleed Educational Assessment tool
SSA	Sub-Saharan Africa

STB	Stop the bleed
WHO	World Health Organization
YoFA	Young First Aiders
SSC	Secondary School Children

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SUMMARY

First aid (FA) is very important for dealing with serious medical issues in order to help save lives, reduce pain, and support recovery. Anyone can provide first aid even young children as studies have shown us from the global North. Training programs have been effective in different places, including some African countries. It's important to include first aid training in schools to help young people learn how to protect themselves and their communities. The culture of First aid is almost inexistent and just as adult lay first-responders have shown effective in the case of road traffic crashes. We want to ascertain the contribution of young children in learning and acquiring these skills and to raise a culture of alert young people in the face of conflict

The goal of this research is to understand how young people view first aid training and what obstacles they face in learning it. The study will focus on children aged 10 to 14 in Fako Division, Cameroon, aiming to improve their knowledge, attitudes, and practices (KAP) towards first aid. It will also look into the challenges of teaching first aid and its impact on children's health and safety.

The research will use a mix of methods, including surveys and interviews in two areas of Fako Division. One area will receive first aid training (the intervention group), while the other will not (the control group). Data will be collected through interviews, group discussions, and questionnaires, and then analyzed using specific software.

The study aims to identify problems that make it hard to teach first aid in schools and find

solutions to these issues. It is also expected that children's knowledge and skills related to first aid will improve, allowing them to respond better in emergencies.

ABSTRACT

Background/Justification: Initial care is paramount for acute medical conditions to preserve life, alleviate suffering, prevent further illness or injury and promote recovery. This initial care is called first aid (FA). Anyone in any situation, including oneself can initiate the act. Adult lay-first responder FA programs have shown effectiveness in curbing acute injury and illness even in some African nations. However, just like in the West, it is necessary to incorporate FA training in the school curricula of the young for self and community awareness raising and safeguarding of one's life.

Objectives: To gain insights into the perceptions and barriers surrounding a Young First Aiders' (YoFA) training program on trauma/injury first aid in both the school setting and the community in the Fako Division and to assess and measurably improve KAP of early SSC on trauma/injury FA using the YoFA training program in Fako Division. The research aims to determine the Knowledge, attitudes and practices (KAP) of FA, identify the challenges of implementing first aid training, evaluate its effectiveness, and assess its overall impact on the well-being of school children and the community among children aged 10 to 14 years in Fako division, Cameroon.

Methods: The study will employ a mixed-methods exploratory sequential approach, combining quantitative surveys and qualitative interviews in the Tiko and Buea health Districts of the Fako Division. It will incorporate cross-sectional surveys and an experimental intervention. One of the districts will be the intervention group and the other the control. The qualitative part will use in-depth interviews, Focused group discussions (FGDs) and scenario observations as data collection methods. While the quantitative part) will use self-administered questionnaires. Following the qualitative data collection of stakeholders including parents, pretested adapted questionnaires will be administered to the children. Data will be analysed using Nvivo and R software to analyse qualitative and quantitative data respectively.

Expected Results: Identification of challenges that prevent FA from being implemented in schools, and understanding probable solutions to address these challenges. Additionally, we expect to increase the KAPs of children in early secondary school regarding FA aspects such as staying safe, calling for help, doing something, and stopping a bleed after building their self-efficacy during the training.

Keywords: First aid, injury/trauma, first aid training, first aid training in school children.

CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 INTRODUCTION

In an increasingly unpredictable world, the ability to respond effectively to emergencies is a vital skill that can save lives and mitigate injuries. Among the most critical of these skills is first aid, which encompasses the immediate care provided to individuals experiencing injury or trauma before professional medical help arrives. Despite the importance of first aid knowledge, many young people lack adequate training, leaving them ill-equipped to handle emergencies that may occur in their daily lives. This gap highlights the urgent need for initiatives aimed at empowering youth with essential first aid skills. The "Young First Aiders (YOFA) Training Program" aims to address this need by equipping early secondary school children in the Fako Division with the basic knowledge and skills necessary to manage injuries and trauma effectively before professional help arrives at the scene or before a victim is transported to the closest health facility. By targeting this age group, the program seeks to instill a sense of responsibility and confidence in young individuals, enabling them to act decisively in emergency situations. The Fako Division, with its unique socio-economic landscape and diverse population, presents both challenges and opportunities for implementing such a program. This research proposal outlines the framework for implementing the YOFA Training Program, which will include comprehensive training modules and practical exercises, and community engagement initiatives. Through this program, we aspire to

not only enhance the first aid capabilities of young individuals but also to foster a culture of safety and preparedness within the community. This initiative represents a proactive approach to child and youth empowerment, ultimately contributing to a more resilient society capable of responding to emergencies with skill and compassion.

1.1.1 Conceptual Definitions

First aid: The European Resuscitation Council (ERC), during its 2020 International Consensus on Cardiopulmonary Resuscitation (CPR) Science with Treatment Recommendations, defined first aid as the preliminary or initial care given to someone with an acute illness or injury [1]. Other international bodies have included the need for care to be given until professional help arrives in the face of a sudden traumatic or debilitating health event [2]. Yet others like the Occupational Safety and Health Administration (OSHA) have included aspects of the aid being given at the location of the event, it being a one-time act, and requiring only little technology and training [3] to preserve life or prevent sequelae.

Youth Empowerment: The process of equipping young individuals with the skills, knowledge, and confidence necessary to take control of their lives and make informed decisions. In the context of the YOFA program, it refers to enabling children to act effectively in emergency situations [1].

Injury and Trauma: Refers to physical harm or damage to the body resulting from various causes, including accidents, falls, or violence. Trauma can be classified as either minor (e.g., cuts and bruises) or major (e.g., fractures or severe bleeding), necessitating different levels of first aid response [2,3].

Training Program: A structured educational initiative designed to impart specific knowledge and skills to participants. In this study, it refers to the YOFA program that

aims to teach early secondary school children essential first aid techniques and principles [4,5].

Emergency Response: The actions taken to address an urgent situation that poses a risk to health, life, or property. This includes the immediate steps taken by individuals trained in first aid to stabilize a person in distress until professional help arrives [6,7].

Skill Acquisition: The process through which individuals learn and master specific abilities or techniques. In the context of the YOFA program, it refers to the development of practical first aid skills among early secondary school children through hands-on training and practice.

These conceptual definitions provide a foundational understanding of the key terms and ideas that underpin the YOFA Training Program, facilitating a clearer focus for our objectives.

1.1.2 Operational Definitions

First Aid Knowledge: Measured by a standardized questionnaire assessing participants' understanding of basic first aid principles, including recognition of injuries, appropriate responses, and the use of first aid equipment. A pre-test and post-test will be administered to evaluate knowledge gained from the training.

Practical Skills Proficiency: Evaluated through hands-on assessments where participants (children) demonstrate specific first aid techniques, such as identification of injuries including wounds and take action towards care. Proficiency will be rated on a scale from 1 to 5 by the trainers based on accuracy and confidence in performing the skills.

Training Attendance: Defined as the percentage of scheduled training sessions attended by each participant. Attendance will be tracked through a sign-in sheet at each

session, with a minimum attendance threshold set at 80% to qualify for the evaluation phase.

Behavioral Intent to Use First Aid: Assessed using a Likert scale survey administered after the training program, measuring participants' self-reported likelihood of applying first aid skills in real-life situations. This will include scenarios where they might encounter injuries or emergencies.

Community Engagement: Measured by the number of community members who give favourable feedback on the activities of the YoFA trainees during and after the intervention. The effectiveness of these activities will be evaluated through feedback forms from community members.

Self-Efficacy in First Aid: Evaluated using a self-report scale that assesses participants' confidence in their ability to perform first aid tasks taught. This will be measured before and after the training program to determine changes in self-efficacy levels.

Injury Response Time: Measured by timing participants' responses in simulated emergency scenarios during training sessions. The time taken to initiate appropriate first aid measures will be recorded and analyzed to assess improvement over the course of the program.

These will help us ensure that the study effectively measures the impact of the YOFA Training Program on early secondary school children in the Fako Division, providing clear metrics for evaluation and analysis.

1.2 BACKGROUND

1.2.1 Goals of First Aid

The ERC First Aid Writing Group (ERCFAWG) stated the goals of first aid to include life preservation, suffering alleviation, preventing further illness or injury and

promoting recovery [1]. They equally agreed that the process can be undertaken or initiated by “anyone in any situation” including oneself. In their guidelines, it was agreed upon that, first aid training at EVERY level should contain pertinent principles which include: Identifying, evaluating, and determining the urgency of first aid requirements, administering care with suitable skills and acknowledging constraints/limitations and requesting further assistance when necessary, including activating the emergency medical services (EMS) system or seeking other medical aid [1]. These principles therefore include individuals or groups of individuals irrespective of age, gender, race or other socioeconomic or demographic characteristics. As such, children are not left out. This is why, in most countries of the Global North, first aid is included in the educational curriculum from a tender age, as young as kindergarten [4,5]. Several countries have succeeded in lowering morbidity and mortality by developing a strong and resilient emergency medical service [6,7] which includes lay-first responders (LFR). This has begun trickling into sub-Saharan Africa [8]. However, the focus is on training adult lay-first responders, particularly regarding road traffic crashes as timely transportation to a care service is essential for favourable outcomes. Children can also save lives and training children on first aid has proven effective in some pilot studies carried out in India and other African settings [9]. It is helpful when planning to train individuals on FA that trained bystanders act promptly and appropriately in the face of emergencies needing a first aid response compared to those that are untrained. [10].

However, it is important to consider the self-efficacy of performing a delicate act such as FA and there needs to be a change of culture and mindset of people within a given sphere or community. Habits cultivated, knowledge refreshers, and application of certain practices over time increase people’s self-confidence and efficacy in performing

such activities [11].

As such, we not only want to improve the knowledge of adults about first aid, but we want to build a culture of trained bystanders who are physically and psychologically equipped to alleviate emergencies in the face or at least call for help. This, we believe needs to be inculcated from a tender age so that the instinct to help alleviate suffering and/or prevent complications from emergencies, particularly trauma/ injury emergencies stays in the subconscious of individuals and develops over time to save lives better. For this reason, we want to use the full developmental potential of our children in the lower secondary schools to begin this initiative.

To achieve our objectives, we must consider some key principles of first aid should adhere to medical standards and be supported by the most reliable scientific findings, should be accessible to all, with universal participation in learning these skills, encouraging supportive actions should be a priority for all individuals and the extent of first aid and supportive actions can differ and might be impacted by environmental, resource, training, and regulatory elements [1].

These principles have further emphasized the need to include children or students in our cohort of trained bystanders or LFRs for our communities, particularly our schools.

1.2.2 Benefits of First Aid Training in Schools

Integrating first aid training into the school curriculum in Sub-Saharan Africa, including Cameroon is crucial for equipping young people with life-saving skills, addressing health challenges, and contributing to overall educational and societal well-being specifically via the development of, firstly,

Vital Life-Saving Skills as responding to medical emergencies, and potentially saving lives in their settings. First aid training provides highly sought-after skills that can be

crucial in emergencies and later in life [12]. Neglecting the importance of first aid could be to the detriment of society which is a similar situation in our country.

Secondly, Risk Evaluation abilities especially since young people are unable to assess risk evaluation in the same way as adults [13][12].

Thirdly, first-aid training decreases disease and injury burden which is a cost-effective way to decrease the burden of disease and injury, particularly in low- and middle-income countries [14].

Fourthly, access to quality education is key to social mobility and poverty reduction, and incorporating first aid training into the curriculum of young children can contribute to this aspect of education [15].

Also, SSA has a high rate of Education Exclusion or inequality. This can be addressed by incorporating first aid training in schools, thus providing additional skills and knowledge to the students or pupils [15].

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Lastly, positive impact on Education Recovery as there is a persistent teacher gap in SSA. Integrating FA training in the educational system, can contribute to the wellbeing of students overall. Thereby, support the education recovery efforts in the region [16].

Since trauma and injury incidents are common in Africa, and the lack of adequate first

aid training often leads to adverse outcomes, this study seeks to identify the challenges in implementing first aid training, evaluate the effectiveness of such training, and assess the overall impact on the well-being of school children and the community.

Limited access to medical facilities and trained professionals exacerbates the consequences of such incidents. First aid training has the potential to mitigate these challenges by equipping students with the knowledge and skills to provide immediate assistance in emergencies around them. However, such training programs' effectiveness and long-term impact in our context are not well-documented.

There have been several FA interventions programs to train children such as “Stop the Bleed” [17].

The "Stop the Bleed" program in the United States is a thorough effort focused on providing people with the abilities and understanding to adeptly address serious bleeding emergencies. The program's reliance on evidence, backing from legislation, and tailored training for high school students demonstrate its dedication to enabling individuals in diverse environments to promptly assist in bleeding emergencies.

“I wanted my kids and others if they were in a situation – it may be an active-shooter situation, or it may be a loved one at home who got hurt – that they could help instead of just standing there, and they could have some kind of power to affect the situation positively,” Kate Carleton, a Sutter Roseville Medical Center trauma nurse and educator said.[17] In the context of the Northwest and Southwest regions of Cameroon that have been in crisis since 2016, this training is timely and should relieve helpless young people when in the face of trauma or injury cases that involve bleeding.

FA training to save lives and alleviate the burden of complications from life-threatening bleeds or injuries from various causes is a useful public health tool to curb preventable

morbidity and mortality. Since Africa faces a double burden of disease (increasing prevalence of communicable and non-communicable disease (NCD), and injuries fall under the NCDs, it is important to put in place strategies and create mental and physical environments that favour the acquisition of basic life-saving skills. Moreover, starting such a practice from a tender age grooms the individuals and their environment to be prepared to give every life another chance by a simple “call for help” or “stop the bleed” act. Eventually improving life expectancy and reducing the rate of handicap from an acute injury.

1.3 PROBLEM STATEMENT

The lack of formal first aid training or its emphasis in the curriculum of most medical schools makes one understand the degree of the gap in knowledge, attitudes and practices in the regular university not to talk of the high, secondary schools and within the communities [18]. This emphasizes the need to raise the awareness of communities of individuals including school children and teachers on FA [19]. As such, it is important for school children and teachers to learn the most basic FA skills as they are often first on the incident or accident scenes within the campuses. This cannot be overstressed as the school is the place where students and teachers spend most of their day. It could be assumed that all schools have dispensaries or infirmaries but in our setting, only a few are effectively functional. According to a report by the World Health Organization (WHO), only four countries in Africa meet the recommended density of health workers per 1000 people, indicating a severe shortage of healthcare professionals on the continent [8,9]. This may translate to the situation of dispensaries or infirmaries in schools in sub-Saharan Africa and Cameroon.

Although there is an improvement in school enrolment over the years in schools in sub-Saharan Africa including Cameroon, there is little or no evidence of the same

improvement in functional dispensaries or infirmaries in the increasing numbers of schools too. Nor is there information on a strategized referral system from the school setting to the health facility despite the need for collaboration between schools and proximate health facilities. Moreover, in the advent of an injury in school premises, there may be delays in referral to appropriate facilities because of undefined standard operating procedures and knowledge deficits with no prior alleviation of the immediate danger to the victim.

Thus the importance of introducing the YoFA program with refresher courses over time in which the people get better at the skill and some may even get into formal training in future.

1.4 RATIONALE OF THE STUDY

Since the most common first aid needs will arise from falls, cuts/wounds, during play periods, compared to other emergencies like choking or syncope, it is essential to focus more on bleeding injuries/trauma first aid since they are more visible trauma injuries compared to strains, sprains, fractures, among others. Furthermore, safe and timely referral (while raising awareness on the need and importance of the general aspects of FA) to the closest HF is essential to maximize the golden hour and avert adverse preventable outcomes.

Since it is a pioneer lay First responder kids' program, we will not focus on Advanced Trauma Life Support as these are not medical professionals although the training program will have a great role in honouring the 'golden hour' in trauma/injury. As such starting with life threating bleeds FA which have proven effective in some countries is a worthwhile beginning.

Despite the numerous factors contributing to life-threatening bleeds (LTB), such as road

traffic crashes (RTCs) and acts of violence, the data on LTB-related fatalities indicates a need for enhanced point-of-injury interventions to effectively prevent LTB [20]. As such, we will apply an adaptation of the “Stop the bleed” and “Do something” programs in our context in Cameroon to help curb complications from emergencies with a special focus on LTBs in the community. Since innovations need time to be a culture among a people, it is essential to begin in small scale and among a population that can grow with the desired behaviour change or culture. One more reason why early secondary school students as pioneers for this program in Cameroon is because they do not have a lot of financial responsibilities and may not be focused on any monetary reward. What will be left to do if the uptake and application is favourable will be to ensure spread to other schools and ensure sustainability.

1.5 RESEARCH QUESTIONS

1. What community perceptions exist about children learning and/or using FA skills within the school setting or thereabouts?

2. What is the level of Knowledge, the attitudes and practices (KAP) of early secondary school children (SSC) on injury/trauma FA?

3. How efficacious and usable is an injury/trauma Young First Aiders’ (YoFA) training program to early SSC and the community?

4. What are the perceived barriers/challenges and benefits of the YoFA program in schools and the community?

1.6 RESEARCH OBJECTIVES

1.6.1 General Objective

1. To gain insights into the perceptions and barriers surrounding a Young First Aiders' (YoFA) training program on trauma/injury first aid in both the school setting and the

community in the Fako Division.

2. To assess and measurably improve KAP of SSC on trauma/injury FA using the YoFA training program in Fako Division.

1.6.2 Specific Objectives

1. To understand the perspectives of stakeholders (school teachers, administrators, parents, community leaders and students) on a school-based FA training (YoFA) program among SSC.

Hypothesis 1: The perspectives of stakeholders like school administrators, teachers, parents, community leaders, and school children needs to be understood to design a comprehensive YoFA program

2. To assess school children's Knowledge, Attitudes (willingness to) and Practices (self-efficacy) (KAP) on trauma/injury FA via the built YoFA training to stop LTBs.

Hypothesis 2: School children have limited knowledge, self-efficacy and practices regarding trauma/injury FA

3. To evaluate the effectiveness and usability of the YoFA training program for SSC to respond to LTBs safely and promptly in their environs.

Hypothesis 3: The YoFA training Program is effective in improving the KAP of SSC and it is usable within the school and community setting.

4. To determine the barriers associated with implementing the YoFA program among early SSC in the Fako Division.

Hypothesis 4: There exist some barrier/challenges in implementing a YoFA training

program in secondary schools.

CHAPTER TWO

LITERATURE REVIEW

It is important to understand some aspects regarding first aid training for children in schools. Here, we will be highlighting the relevance of Advanced Trauma Life Support concepts, the injury burden among school children, the qualifications of potential educators, and the appropriateness of school-based training. There is a clear consensus on the necessity and benefits of teaching first aid in schools, as it equips children with essential life skills, enhances their confidence, and promotes a safer environment. Future research should focus on developing effective training programs tailored to this age group, considering the emotional aspects of learning and the varied contexts in which children may need to apply their skills particularly in our setting.

First aid training is an essential aspect of emergency preparedness, particularly for children aged 10 to 14 years. This age group is increasingly exposed to various risks, both in schools and everyday life. Here, we will explore four key areas related to first aid training for children: the concept of Advanced Trauma Life Support (ATLS), the injury burden among school children, potential educators of first aid, and the appropriateness of implementing first aid training in schools.

Advanced Trauma Life Support

Advanced Trauma Life Support (ATLS) is a systematic approach to the management of trauma patients, focusing on rapid assessment and treatment of life-threatening conditions [3]. The ATLS course teaches a systematic and concise approach to the early care of trauma patients, emphasizing the immediate management of injured patients and the rapid assessment of life-threatening conditions [3].

Additionally, it is recognized as a foundation of care for injured patients, providing a

common language and approach for trauma management. The program is designed to ensure that life-threatening injuries are identified and treated promptly, which is crucial in trauma care [10]. This systematic approach is essential for improving trauma outcomes and is widely adopted in emergency departments around the world [3,11].

While ATLS is primarily designed for healthcare professionals, its principles can be adapted for educational purposes to teach children basic life-saving skills [2]. Research by Heller et al. (2020) suggests that introducing simplified versions of ATLS concepts can enhance children's understanding of prioritizing care in emergency situations.[2] By familiarizing children with the basic principles of trauma management, such as airway management, breathing, and circulation, they can better respond to traumatic incidents that may occur in their environments. However, it is crucial to tailor ATLS concepts to be age-appropriate. Studies indicate that children aged 10 to 14 are capable of understanding basic trauma care principles when presented in an engaging format [12]. This adaptation can include role-playing scenarios and interactive demonstrations, making the training more relatable and practical for young learners.

Injury Burden Among School Children

The injury burden among school children is significant, with various studies highlighting the prevalence and impact of injuries in this age group. According to the World Health Organization (WHO), unintentional injuries are a leading cause of morbidity and mortality among children aged 10 to 14 [13,14]. Common injuries include falls, sports-related injuries, and accidents during transportation. The high incidence of injuries underscores the necessity for effective first aid training programs in schools, which can equip children with the skills needed to respond to such incidents [15].A study by Tse et al. (2023) found that children who received first aid training were more likely to recognize and respond appropriately to injuries among their peers,

thus reducing the severity of injuries and improving outcome [16]. This highlights the critical role of first aid training in mitigating the injury burden and promoting a safer school environment.

Who Can Teach Children First Aid?

The effectiveness of first aid training is heavily influenced by the qualifications of the instructors. Potential educators include trained teachers, parents, healthcare professionals, and peers.[17] Research by Baker et al. (2021) indicates that trained teachers are often the most effective facilitators, as they can integrate first aid training into the school curriculum and ensure that the material is delivered consistently.Parents also play a vital role in reinforcing first aid knowledge at home. A study by Alshehhi and El-Aidie (2023) found that parental involvement in first aid education significantly enhances children's retention of skills [18]. Additionally, peer-led training programs can foster a supportive learning environment, where children feel more comfortable practicing skills with friends [19]. However, the effectiveness of peer training may depend on the peers' knowledge and confidence in first aid skills.

Is It Appropriate to Train Children in First Aid in Schools?

The appropriateness of training children in first aid within school settings has been a topic of considerable debate. Advocates argue that early education in first aid is essential, given the prevalence of injuries and emergencies in school environments. Training not only empowers children to act in emergencies but also promotes a culture of safety and responsibility [20,21]. Conversely, some critics raise concerns about the emotional and psychological readiness of children to handle traumatic situations. Research suggests that while children can learn first aid skills, care must be taken to ensure training is age-appropriate and does not induce fear or anxiety about emergencies. Schools should adopt a balanced approach that emphasizes skill

acquisition while providing emotional support and context, ensuring that children feel prepared rather than overwhelmed [15,17].

2.1 CONCEPTUAL REVIEW

First aid, was earlier defined as the initial care provided for an acute illness or injury, with goals including: preserving life, alleviating suffering, preventing further illness or injury and promoting recovery. First aid can be initiated by anyone in any situation including self-care [21].

General characteristics of the provision of first aid, at any level of training, include: Recognising, assessing and prioritising the need for first aid; Providing care using appropriate competencies and recognising limitations; Seeking additional care when needed, such as activating the emergency medical services (EMS) system or other medical assistance.[1]

In some studies around the world, it was seen through qualitative and quantitative studies that, although people in varying fields are aware of the importance of first aid for their professional development (e.g. among teachers in Spain), there is no such training in their careers or schools. This raises a challenge in understanding how to act or react in case of emergencies on the job [22].

The ERC 2021 guidelines advise that yearly, Cardio-pulmonary Resuscitation (CPR) training should provided to all schoolchildren. From 2015, the KIDS SAVE LIVES statement has recommended that all schools worldwide should offer two hours of instruction per year to students by the age of 12 [1]. Additionally, evidence shows that prehospital haemorrhage arrest using a tourniquet is more effective than waiting to reach a trauma centre before applying one. The latter has higher chances of transfusion within the first hour of arrival and higher odds of mortality from haemorrhagic shock

[23]. However, it must be the right type of tourniquet and it should be applied in the right way.

In some developed nations like Spain, the United States of America (USA), and Canada among others, the contents of FA are part of the official curriculum of primary education (i.e., aged 6–12 years) [24]. Studying the presence of FA in educational legislation in Spain showed that although it is included in primary school curricula and compulsory in secondary education, it is taught mainly during Physical Education classes only. It reveals the need to make it an individual course for optimum outcomes.

The Ecological model incorporates the individual, interpersonal, institutional, community, public policy and chronosystem in the uptake and implementation of the YOFA program.

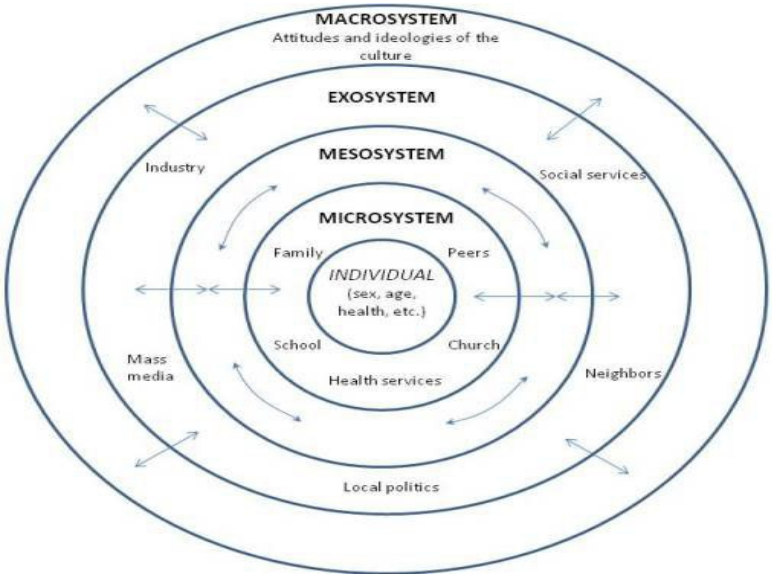


Figure 1: Illustration of Bronfenbrenner's ecological framework by Mash in 2019

The PPPM guides us through the planning process to avoid missing aspects important to a project by first knowing the outcomes, and then walking back to address some factors that will enable us to reach our expected results.

Predisposing,

Reinforcing and

Enabling **C**onstructs in

Educational

Diagnosis and

Evaluation; aim to map educational 'diagnoses and planning [48].

Policy,

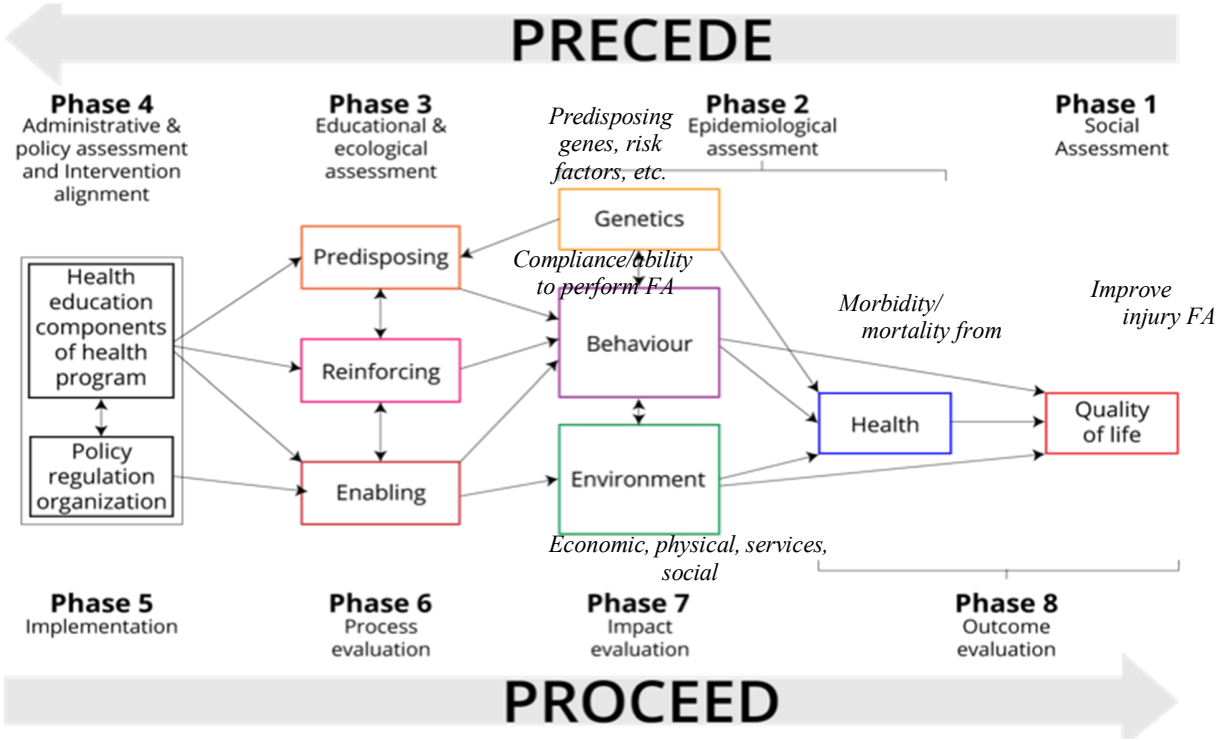
Regulatory, and

Organisational **C**onstructs in

Educational/**E**cological and

Environmental

Development (guides socio-ecological assessment and planning) [48,49].



We will be using these two as the components of the former are incorporated in the later.

Predisposing Factors to performing skills from the YoFA program taught: Knowledge (Training given), attitudes, and practices, motivation, self-efficacy.

Enabling factors: Antecedents of behaviour that facilitate motivation to perform the behaviour e.g., accessibility to FA "Stop the bleed" kit, to a telephones availability of a teacher to guide them through, and Health facility to receive the patient, skills, and laws.

Reinforcing factors: Rewards or punishments following or anticipated as a consequence of behaviour e.g., does the family encourage the child to learn the FA skills and apply what is learnt? What is/are the thoughts of peers, teachers, and other stakeholders? (here we see the interpersonal and community aspects of the ecological model come into place).

2.2 CONTEXTUAL REVIEW

Approximately 5.1 million deaths each year in sub-Saharan Africa (SSA) can be linked to conditions that might have been addressed through prehospital and emergency care [25], but which is however below standard or under-developed in SSA. Thus, the World Bank has been promoting first-aid training as. A cost-effective way to lower the injury and disease burden with an averted Disability-adjusted life year (DALY) of only 8 USD [25]. While the majority of research showcasing the effectiveness of adult first aid training programs has been carried out in Western settings [26–29], some studies from sub-Saharan Africa and various African Red Cross-National Societies conduct first aid training for adult laypeople. However, these trainings mostly took into consideration the Western context. There was an increased need for first aid in the SSA context by the African Red Cross societies, which gave birth to the AFAM (Africa First Aid Materials) in 2011 [30,31].

Given the growing evidence from Western nations indicating that children and

adolescents between the ages of 5 and 18 can acquire specific first aid skills and are open to offering assistance [32–34], instructing children in first aid appears to be a favorable approach for maximizing its effectiveness. Before Buck et al., in 2020, there was no study to test first aid training effectiveness among children in the African context and this led to the development of an educational pathway for FA training among kids [14].

In SSA, there were some barriers to FA training identified which include: (1) Limited scientific research and publication on the topic in SSA has contributed to a limited understanding of the specific barriers to FA training there [35] and in the SWR. (2) The limited resources allocated to healthcare spending. This restricted healthcare spending may impact the availability and accessibility of first-aid training programs, thereby acting as a barrier to widespread implementation [14]. (3) The lack of implementation plans for FA training in most SSA countries may contribute to the prevalence of barriers. The absence of comprehensive strategies and initiatives to promote and implement FA training programs could hinder their effectiveness and reach [35]. (4) The cost-effectiveness of a comprehensive FA training implementation program in LMICs including Cameroon is a current and foreseen problem [14].

2.2.1 Importance of First Aid Skills among School Children and Teachers

Given the challenges in accessing timely medical care, it becomes crucial for school children and teachers to have basic first-aid skills. The immediate care given to any person in a medical emergency, as provided by first aid, can significantly save lives [36,37].

The lack of formal first aid training in the teaching curriculum of most medical schools further emphasizes the need for first aid skills among school children and teachers. This is supported by the American Red Cross, which offers first aid programs for schools,

allowing teachers and administrators to train their students in first aid for free [18,19].

In addition, a study aimed to analyze the opinions and knowledge of future teachers at a Spanish public university regarding training and the need for first aid. The findings of this study can further support the importance of integrating first aid training into the education system [22].

The combination of inadequate access to health care facilities and emergency services in certain regions and the potential for first aid skills to make life-saving differences underscores the importance of promoting FA skills among school children and teachers.

2.2.2 Potential Impacts of First Aid Training on Reducing Injury-Related Morbidity and Mortality in the School Setting and Beyond

First aid training in the school setting can have a significant impact on reducing injury-related morbidity and mortality. Here are some potential impacts supported by some studies:

Immediate Assistance and Survival Rates: In rural Bangladesh, it was seen that effective bystander cardiopulmonary resuscitation (CPR) provided immediately after cardiac arrest can double a person's chance of survival by maintaining vital blood flow to the heart and brain [38].

Studies conducted in developed countries on non-fatal injuries have reported first aid to play a significant role in reducing mortality rates [38].

First aid offered by an untrained or trained provider is increasingly essential to reduce mortality and severity of injuries in developing countries [38–41].

Reduction in Severity of Injuries:

Research on severe non-fatal injuries such as burns, blunt trauma, and road traffic

incidents in high-income settings has found a significant reduction in mortality rates when first aid was applied [38].

Disaster Preparedness: Community first aid training for disaster preparedness can play a critical role in saving lives and reducing morbidity at the scene in the immediate aftermath of a disaster [42].

Educational Impact:

Providing necessary education with more effective methods, such as role-playing, can be effective in reducing mortality and morbidity due to lack of first aid care in crucial moments [43].

First aid training programs should be introduced at the school and college level in developing countries to decrease the early mortality and morbidity of accidents and emergencies [44].

Impact on Children's Safety: Accidents in schools are a significant cause of childhood injuries and deaths, and all staff needs to have first aid training to ensure the safety of children [45].

With all this, it means first aid training in the school setting has the potential to significantly reduce injury-related morbidity and mortality by providing immediate assistance, reducing the severity of injuries, and preparing individuals to respond effectively in emergencies. First aid and home safety training – with a focus on

2.2.3 Types of First Aid Training programs for children

In a bid to develop an Evidence-based Educational Pathway for the integration of FA straining in school curricula, Buck et al. perused studies in the Cochrane Library, Embase and Medline to identify various F A trainings and pathways given to kids. The

studies found included FA training on [14]:

1. Emergency call – which involved calling an emergency number. A recall amongst children 5-16 years old in varying groups and different studies (5-6, 6-7, 10-12, 11-12,13-16, 11-16 years). Also, the "Do Something" intervention which spanned between calling for help and injury FA was a 6-month course taught among 13-to-14-year-olds using a textbook style covering the preparation for action, situational overview, the ABC plan (Airway, Breathing, Circulation), administering FA, and concluding FA. It also included a series of seven (7) videos addressing topics such as chest pain/cardiac arrest, severe epileptic seizure, head or neck injuries, burns, internal bleeding, airway obstruction, and drowning [14].
2. Cardiopulmonary resuscitation (CPR) – hands-on and practised-based use of manikins and simulation to demonstrate scenarios among 6-7-, 11-12-, and 13–16-year-olds [14].
3. AED (Automated External Defibrillator) used among 13 to 19-year-olds via video clips with different cardiac arrest situations [14].
4. Recovery position – this measured the knowledge and ability of children to perform correct recovery position in various studies of children aged 6-7, 10-12, 10-11, 11-12 years old [14].
5. Choking – training children on FA for choking and obtaining their knowledge scores before and after the training or using a control group of "no training" amongst 10-12- and 11–16-year-olds [14].
6. Injuries e.g., an Injury Minimization Program for Schools (IMPS) where a program developed during an entire academic year within the school curriculum for 10- to 11-year-olds. This one contained 2 major packs: an educational pack where kids were

provided with materials and knowledge to handle aspects ranging from road safety, home, fire, electricity accidents, poisons and waterways. The second pack was the hospital visit where children learnt to perform basic life support and resuscitation, watched interactive videos about common accidents (burns, cuts, electrocution, FA responses) and toured the emergency and Accident (E&A) unit [14]. Another example is the "Stop the Bleed" program in the United States that is currently ongoing [17].

7. Poisoning – taught within the FA and home safety training by the American Red cross alongside bites, stings and allergies to 11 to 16-year-olds [46].

Most of these studies measured outcomes in children immediately and sometime after the training (3 to 12 months or thereabouts). However, none of these studies had a qualitative component that evaluated the usability and acceptance of the program. In our context in Cameroon, this is a critical component, particularly with the crises on the NOSO and the increasing educational standards and emancipation of individuals.

Following this study in 2020, an educational pathway was developed outlining the age range for which various FA activities should either be "Encouraged", "Known or Know How" and/or "Repeated" with specifics as to the knowledge, skills and attitudes regarding the specific act. For instance, preschoolers (3-6 years) should be encouraged to know why they must seek help quickly, should know how to wash their hands, be encouraged to stay safe and to be encouraged to correctly stop nose bleeds. This is different from what is required for 9-10, 11-12, or teenagers of varying age groups where they are required to know and apply certain skills and repeat training is always a bonus. According to this pathway, children should be able to know why and how to call for help in the face of an emergency, put on disposable gloves, ensure their safety, recognize a skin wound, equipment needed for treating a skin wound, correctly treat a

skin wound, correctly apply spiral bandage, correctly stop a nose bleed between 7 and 8 years of age and be encouraged to understand other basic skills. By 9-10 years, they should know that they are not to move seriously painful or hurt parts of the body, know the importance of stopping bleeding as fast as possible, know when to refer a victim with a nosebleed, etc. By 11-12 years, they should receive a repeat of what they know and start applying what they were encouraged to know at a younger age e.g., apply a compression bandage, know 3 possible injuries to the motor system (sprain, dislocation, breakage or fracture), know how to recognize an injury to bones, muscles, or joints. By a later age (13 to 14 years), they should be apt to correctly treat a skin wound if there is no clean water or too little. Correctly treat a wound that contains a foreign object. Correctly remove a splinter. Using disinfectant, know when to refer someone with a splinter to the doctor, among others. As the age group increases, what the child needs is mainly a repeat of what they are expected to know or what they were encouraged to know at an earlier age.

E: Encourage K: Know/Know How R: Repeat	Pre-school (3–6 years)	First grade PS (7–8 years)	Second grade PS (9–10 years)	Third grade PS (11–12 years)	First grade SS (13–14 years)	Second grade SS (15–16 years)	Third grade SS (17–18 years)
1. General							
Knowledge							
The pupils:							
• Know why they must find help as quickly as possible from an adult in an emergency situation	E	K	R	R			
• Know the general emergency number		K	R	R	R		
• Know the six basic principles of first aid				K	R	R	
• Know what each emergency service does			E	K			
Skills							
The pupils can:							
• Wash their hands	K	R					
• Put on disposable gloves		K	R	R			
• Use the six basic first aid principles when looking after a victim				K	R	R	R
• Recognize the emergency services symbols			E	K			
Attitudes							
The pupils are prepared:							
• To help	E	K	R	R	R	R	R
• To comfort the victim	E	K	R	R	R	R	R
• To ensure their own safety	E	K	R	R	R		
• To fetch an adult	E	K	R	R	R	R	
The pupils recognize the importance of:							
• Fetching an adult	E	K	R	R			
• Alerting the emergency services		E	K	R			
• The pupils are prepared to touch a person unknown to them		E	R	R	R		
The pupils recognize the importance of:							
• Avoiding infection				K	R	R	R
• Making the victim comfortable				E	K	R	R
5. Skin wound							
Knowledge							
The pupils:							
• Recognize a skin wound	E	K	R	R			
• Know which equipment is needed for treating a skin wound	E	K	R	R			
• Know when a skin wound is serious and when to refer the victim to the doctor			K	R	R		
• Recognize a graze, a cut and a stab wound			E	K	R	R	
• Know the importance of vaccinations			E	K	R	R	
• Know why tetanus is dangerous and be aware of the link with skin wounds				K	R	R	
• Know that a victim with a foreign body in the wound must always be referred to the doctor				E	K	R	R

Skills							
The pupils can:							
• Correctly treat a skin wound when water is available	E	K	R	R	R		
• Correctly apply a spiral bandage [technique]		K	R	R	R		
• Stem the bleeding of a wound that does not stop bleeding by itself		E	K	R	R		
• Correctly treat a skin wound if there is no clean water or too little			E	E	K	R	R
• Correctly treat a wound that contains a foreign object					K	R	R
• Correctly remove a splinter					K	R	R
Attitudes							
See Attitudes general learning trajectory							
The pupils recognize the importance of:							
• Using disinfectant (if there is no clean water or too little available)				E	K	R	R
• Correctly treating a wound containing a foreign object				E	K	R	R
6. Burns							
Knowledge							
The pupils:							
• Recognize a burn	E	K	R	R	R		
• Know what to do in the event of a burn (regardless of the degree of the burn)	E	K	R	R	R		
• Know when a burn is serious and when to refer the victim to a doctor		E	K	R	R		
• Know the difference between a first, second and third degree burn				E	K	R	R
• Know that they must alert the emergency services if the burn is serious			E	E	K	R	R
• Know what can cause a burn (heat, chemicals, . . .)	E	E	E	E	K	R	R
Skills							
The pupils can:							
• Correctly treat a burn	E	K	R	R	R		
• Alert the emergency services if the burn is serious			E	E	K	R	R
Attitudes							
See Attitudes general learning trajectory							
• The pupils recognize the importance of continuously applying water to a burn	E	K	R	R	R		
• Recognize an injury to bones, muscles or joints			E	K	R	R	
• Know the difference between an open and closed injury					K	R	R
Skills							
The pupils can:							
• Correctly treat a minor injury to bones, muscles or joints				E	K	R	R
• Correctly apply a cross-bandage to a hand or foot [technique]				E	K	R	R
• Administer first aid to a victim with an open break					K	R	R
Attitudes							
See Attitudes general learning trajectory							

Figure 2: Table of what children should be Encouraged, Know/Know-How, and when to receive Refresher/Repeat courses on the Previous FA skills.

In the case of injury/trauma it was seen that children 11 to 12 years should Recognize the AED pictogram • Know that they must always call the emergency services if the victim is unconscious (and when the AED box alarm goes off) • Know the purpose of an AED.

However, in Sub-Saharan Africa, there is no FA training in the tender ages. Starting this will require an adaptation of our context to determine when to introduce what and we also need to consider the mindsets of stakeholders.

CHAPTER THREE

MATERIALS AND METHODOLOGY

3.1 STUDY AREA

We will carry out this project in the Fako division of the Southwest Region of Cameroon. The division is made up of four health districts. These are Buea, Limbe, Tiko and Muyuka health districts (HDs). The Buea and Tiko Health Districts will be selected based on the district with the highest number of trauma cases recorded in the DHIS2 and the security situation within the region.

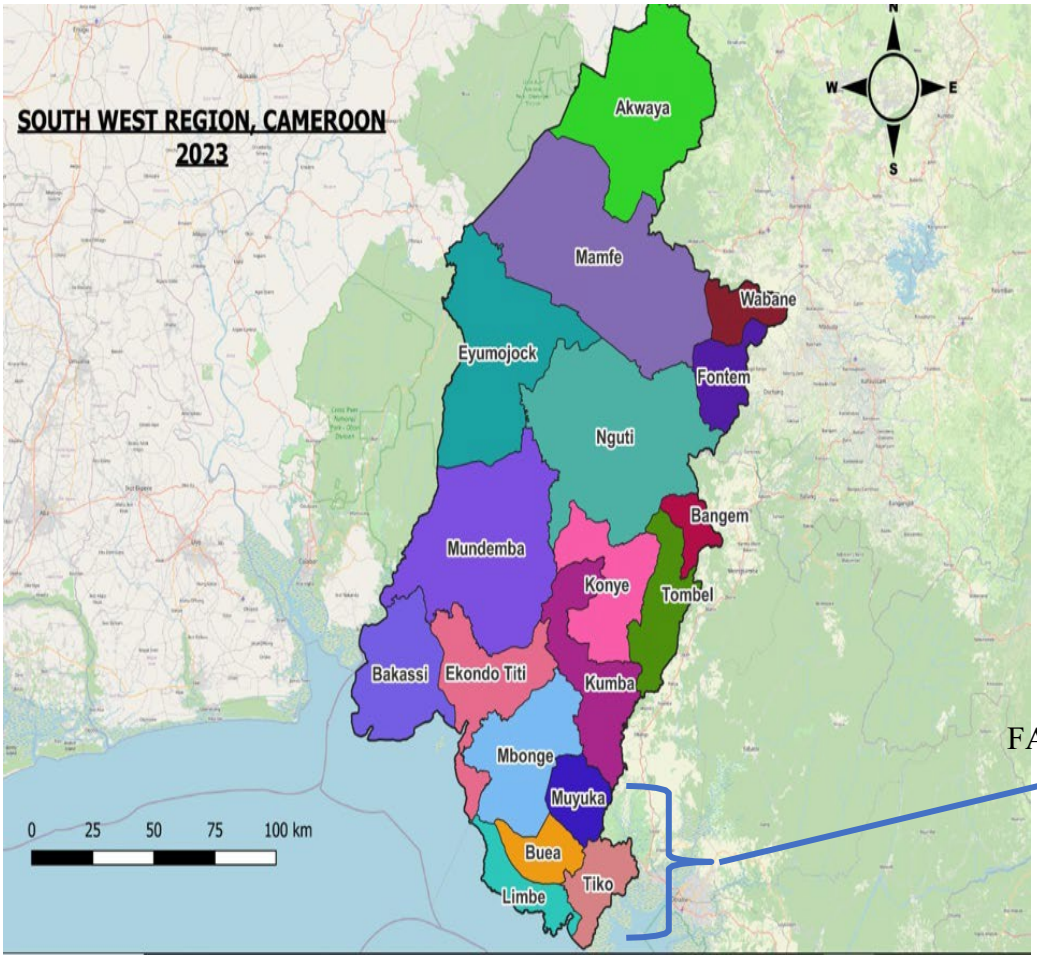
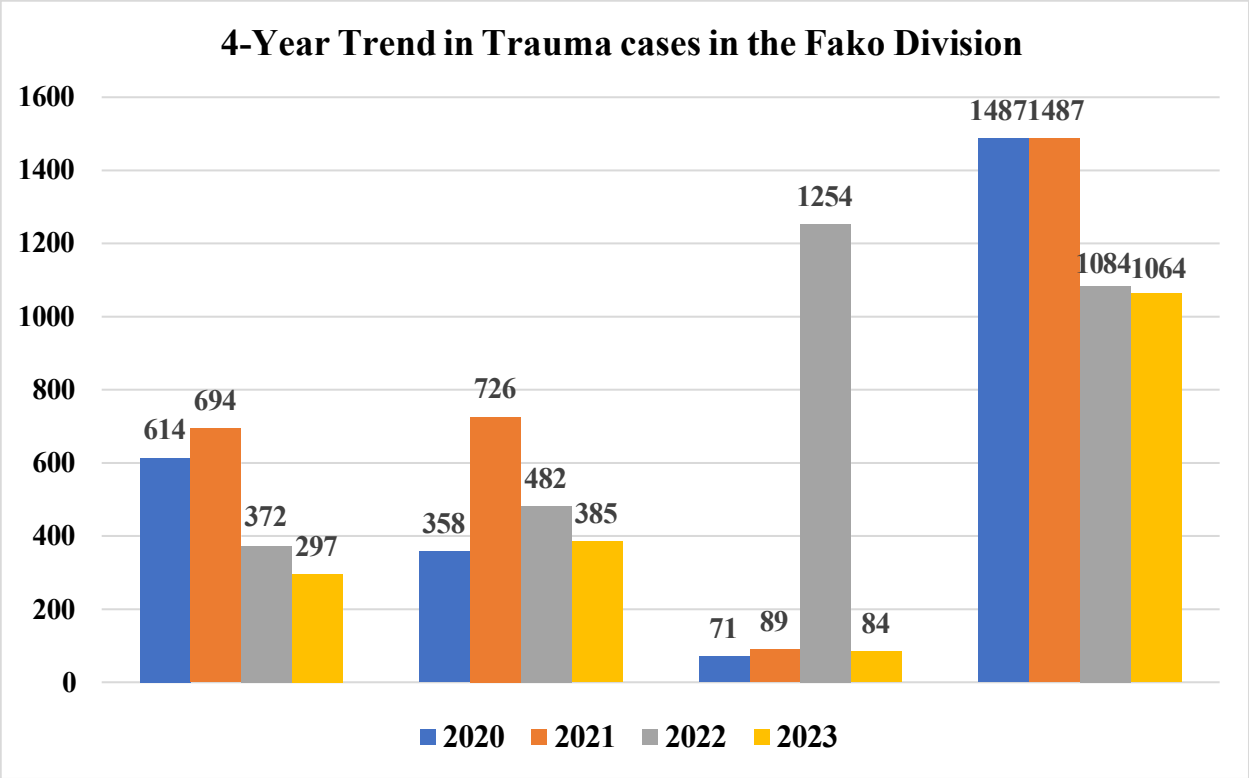


Figure 3: Map of the Southwest Region of Cameroon. Source, Southwest Regional Delegation of Public Health (RDPH), Cameroon



Source: DHIS2, Minsante, Cameroon

Figure 4: The number of trauma cases recorded in Fako division over 4 years [47]

Although the picture shows a drop in the number of cases recorded over the years, there is a probability that it is mostly due to underreporting of cases as there have been a lot more accidents that have occurred over the years and whose information was not captured by the health districts.

Table 1: Average number of Trauma cases in the past four years on DHIS2 [47]

Source: DHIS2, Minsante, Cameroon

Year	Limbe	Buea	Muyuka	Tiko
2020	614	358	71	1487
2021	694	726	89	1487
2022	372	482	1254	1084
2023	297	385	84	1064
Average	**494.25**	487.75	374.5	**1280.5**

Although Limbe is the next district with the next highest number of trauma and injury cases after Tiko, we took Buea to avoid the confounding effects of the Lay First-responders (LFR) program taking place in the Limbe Health District.

3.2 STUDY POPULATION

The qualitative part will include teachers, principals and vice (of the selected schools), parents (whose kids attend the selected schools), regional delegates (of secondary education and public health) and a few community leaders like quarter heads and or chiefs of both the control and the intervention districts of Buea and Tiko.

The cross-sectional survey will involve students in the early secondary school classes (forms 1 to 3) of the selected state secondary schools (SSS) in Buea and Tiko. These classes are chosen because they have most of the children aged 10-14 years which is the age trained in most studies and we believe these ones have just crossed a milestone from the primary school to get to secondary.

The intervention part will also involve the early SSC who take part in the cross-sectional survey before and after the intervention.

The evaluation will involve all the students as well as the stakeholders in both intervention groups who had been interviewed at the start of the study to determine the impact of the YoFA training program and challenges faced. It will also include the students to assess the need for refresher courses on FA for LTB and equally identify challenges faced during the three months prior to the summative evaluation period.

3.3 STUDY DESIGN

This research will utilize a mixed-methods exploratory sequential design, incorporating both quantitative surveys and qualitative interviews. Exploratory because aspects of the qualitative aspects will be used to adjust the design of the YoFA training program which

will help develop a comprehensive program for such a program among SSC. The next design is a cross-sectional design with pre and post-tests to both the interventional and control groups to obtain a general baseline in both districts and assess the impact of the YoFA program.

3.3.1 Qualitative Part

Discussions or interviews on perspectives of individuals and groups of individuals regarding the acceptability and usability of FA-trained kids within the school and in the community. It will also seek to understand their thoughts on incorporating an FA training program within the school curriculum. It will be conducted with key stakeholders, including school administrators, and community leaders as well as students of the school.

It will precede the qualitative part and include Focused group discussions (FGDs), in-depth interviews of certain community and administrative stakeholders within the school and observations of scenarios.

3.3.2 Quantitative Part:

The quantitative aspect will involve administering questionnaires to students to assess their knowledge, attitudes (confidence), and practices (utilisation/usability) of FA trauma/injury skills before and after their training. This will focus mostly on staying safe, calling for help and stopping a life-threatening bleed. The intervention will include training the intervention group in reasonable clusters on the same subject matter and assessing the change in KAPs before and after the intervention. It will also include scenarios to test the efficacy of participants in carrying out the First Aid Act.

PERIOD OF STUDY

The study will be a 10-month study from September 2024 to July 2025 including administrative and ethical clearance needed.

3.4 ELIGIBILITY CRITERIA

3.4.1 Inclusion Criteria

For the Quantitative part

- Form one (1) to three (3) students (ages 10 to 14 years) in the four (4) state secondary schools (SSS) in Tiko and Buea health districts who are willing to participate in the study.
- Students officially enrolled in the school for the academic year
- Those students whose parents consent for their children to be part of the study.

For the Qualitative part

- Stakeholders within the educational care system – Principals, community leaders, and parents who consent to be part of the study.
- Students whose parents give parental consent for their children to participate in the study.

3.4.2 Exclusion Criteria

- Any child who is not in forms 1 to 3 (10 to 14 years old) in the selected schools
- Any student who misses any of the training sessions
- Any student who willingly backs out of the study.
- Any child whose parents do not give parental consent for them to be part of the study.

Age Limits

- For the Secondary School Children (SSC): 10 to 14 years old
- For the various stakeholders (school administrators, teachers, community leaders, and parents): Adults between 21 and 65 years.

3.5 SAMPLE SIZE AND SAMPLING

Sample Size Calculation

For the cross-sectional study and Intervention

Assuming an equal number of control and intervention subjects, a prevalence of the outcome in the controls of 0.5, and a prevalence in the intervention group of 0.75 (an absolute increase of 25%)[17] with a power of 80% and 5% error margin, we calculated the sample size needed using STATA.

Estimated sample sizes for a two-sample proportions test Pearson's chi-squared test using STATA
H0: p2 = p1 versus Ha: p2 != p1 Study parameters:

alpha = 0.0500
power = 0.8000
delta = 0.2500 (difference)
p1 = 0.5000
p2 = 0.7500

Estimated sample sizes:

N = 116
N per group = 58

If we assume a 15% drop out rate, we have a sample size of 15%*116=17.4 Thus, sample size is 116+17.4 = 133.4 ~= **134**

For each group, the sample needed is therefore **N = 67 students**. **Sampling**

Since this is a crisis area, we will use convenience sampling to choose the Health Areas (HAs) that are secure and geographically accessible (safest) in both HDs. Out of seven (7) and eight (8) HAs in Buea and Tiko HDs respectively, there are 4 accessible HAs in each. Of these, one HA from each HD does not harbour a state secondary school (SSS).

Leaving us with 3 HAs to work with in each HD. Each of these HAs contains 1 SSS but for 1 HA from each District which has 2 SSSs. We would work with all these State schools to ensure that we get students from most of the communities around the schools, thus ensuring the representativeness of our samples. To avoid spill-over, one of the districts will be selected as intervention HD and the other as the control.

Stratified random sampling will be used to select the students for the study from a sampling frame of the list of students in each classroom concerned.

We would use probability proportionate to size to choose the specific number of students to participate in the study per classroom (A, B, and C) for each class.

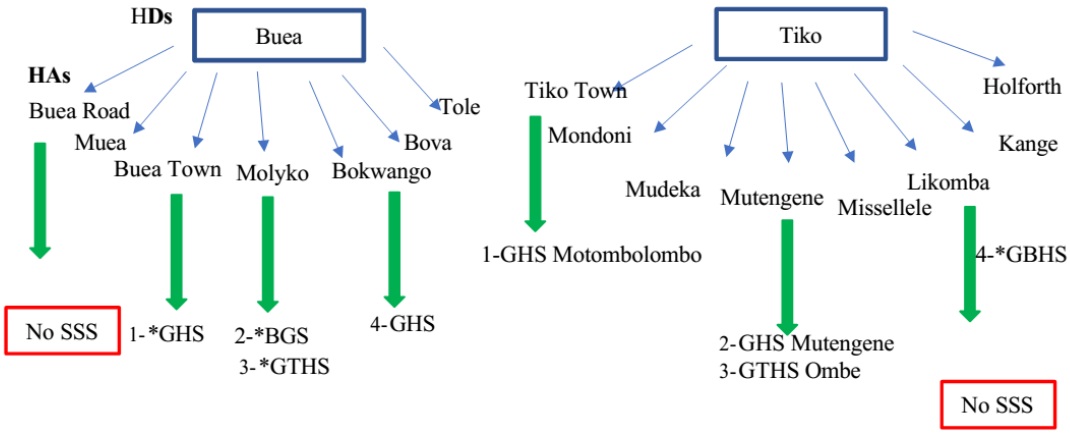


Figure 5: Selection of HAs and Schools for Implementation.

**GHS-Government High School; BGS-Bilingual Grammar School; GTHS Government Technical High School; GBHS government Bilingual High School*

For each school distribution of the participants will be as follows:

A) **For the Qualitative part:**

The qualitative part will be sampled purposively.

Table 2: Number of Participants to be chosen per school for the FGDs

Health District	Schools	FGD Category of Participant	Number per school
Buea	1-BGS Molyko	Parents (1) Teachers (1) Students (1)	3
	2-GTHS Molyko	Parents (1) Teachers (1) Students (1)	3
Tiko	1-GHS Mutengene	Parents (1) Teachers (1) Students (1)	3
	2-GTHS Ombe	Parents (1) Teachers (1) Students (1)	3
	Total		**12**

N.B: Each focused group discussion will be comprised of 5 to 8

Table 3: Number of Participants to be chosen per school for the In-depth interviews

Health District	Schools	Category of Participant	Number per school
Buea	3- GHS Bokwango	Parents (2) Teachers (2) School Admin (1) Students (2)	7
	4-GHS Buea Town	Parents (2) Teachers (2) School Admin (1) Students (2)	7
Tiko	1-GHS Mutengene	Parents (2) Teachers (2) School Admin (1) Students (2)	7
	3-GHS Motombolombo	Parents (2) Teachers (2) School Admin (1) Students (2)	7
	Total		**28**

B) **For the Quantitative or intervention phase**

To recruit participants and avoid spill over among initially recruited participants, it was more feasible to randomly choose one classroom from among the selected schools from which to train the students. Thus, instead of table 4 below, we will apply table 5.

Table 4: Initial plan of the YoFA training Prticipants.

Buea	**N**	**Tiko**	**N**
GHS Bokwango	15	GHS Mutengene	15
GHS Bueatown	15	GTHS Ombe	15
BGS Molyko	20	GBHS Tiko	20
GTHS Molyko	20	GHS Motombolombo	20
TOTAL			**70**

Table 5: Number of students to train on YoFA Program

Intervention group	**School Name**	**Control**	**School Name**
Buea	BGS Molyko	**Tiko**	GHS Mutengene
Number of Participants	**70**		**70**

3.6 STUDY PROCEDURE

The study will use the precede proceed planning model and the ecological model described in the review of Literature following the steps below from planning the research project, through implementing the intervention, and to the monitoring and Evaluation phases.

Step 1: Preparatory/Planning Phase

The planning model to use here will be the Ecological model in conjunction with aspects of the PRECEDE-PROCEED planning model (PPPM).

The other steps of the planning phase include:

- Preparing documents to apply for ethical clearance and administrative authorizations to perform the study.
- Authorizations are needed from the Regional Delegation of Secondary Education for the SWR (1), the divisional delegates/inspectors of the aforementioned ministry (2), the School Principals (8) the Regional Delegation of Public Health

(RDPH) for the SWR (1), and the Chiefs of Health Districts (CHDs) (2)

- Constitute and train a team of 4 trainers medical doctors/students and data collectors and interviewers.
- Obtain a sample frame of students from the various classrooms of the various schools and proceed with the selection of participants as described above.
- Enlist all potential teachers and stakeholders to be interviewed

Step 2: Intervention Phase

- Organize students to be trained in groups of 10.
- Each training session will last 2.5 hours and each group will be trained for 2 days.

That is a total of 5 hours.

- Overall, it will take 6 weeks (1 month, 2 weeks) to train 3 groups of 25 students each as shown in *Table 6* below.
- The Sessions will begin with a 30-to-45-minute pretest followed by theory on day 1. Then mixed theory, video, and practical sessions on days 1 and 2. Main contents Content include: 1. responding to emergencies (first aid) and on prevention of injuries: “Call for help”, fever and contents of a first aid kit, 2. controlling Life-threatening bleeds (LTBs) and immediate first aid in burn cases, fractures, and/or dislocations in the face of LTB [11,46]. It will include the use of cartoons, simple language and memory aids:

(1) Video, (2) small group teaching, (3) demonstration manikin, (4) supervised practice.

- Interviewing the teachers, principals and other stakeholders. Interviews will be done using interview guides and tape recorders.
- For the control group, we will do a selection of the participants as described and there

will be a session for pretesting at the beginning of the intervention, at the immediate end, and 3 months after. **During the 3 months follow up period, we will visit the schools during their Wednesday club days every 2 weeks for 30mins to 1hour, to document their experiences and challenges in real time and their use of the skills.**

The qualitative part will take place before the quantitative pretesting of both groups begins.

Table 6: Plan of training and Evaluation of intervention groups

HA	School	N	Training Period in 2024	Date for Last Evaluation, 2024
Molyko (Intervention)	BGS Molyko	25	Nov 6th, and 13th	Feb 5th
		25	Nov 20th, and 27th	Feb 19th
		25	Dec 4th and 11th	March 5th
Mutengene (Control)	GHS Mutengene	70	November 6th	Feb 26th
	Total	**145**		

Step 3: Evaluation Phase

This comprises the evaluation of students' perceptions, barriers, and challenges in learning and applying the skills and lessons learned. It will equally involve evaluating parents' and stakeholders' perceptions about the program and including FA training in school curricula. It will involve the use of evaluation forms. This will take place about the same time as the post-three-month evaluation.

Knowledge will be assessed by evaluating whether the participants have ever heard of first aid or observed situations in which first aid was needed. They will be expected to have an increase in knowledge of first aid, especially regarding calling for help, stopping acute and life-threatening bleeds (LTB), and referrals after the training.

Before the training, we expect people not to have practiced first acts ever or to have

done it in a wrong way or to be scared to carry out specific first aid acts. After the training, we expect them be more alert and identify situations needing first aid acts. Additionally, we expect their self-efficacy and confidence to perform first aid acts to increase and to effectively carry out first aid acts within their community or the school premises that will be documented using designed forms.

We will consider criteria for success as the proportion of persons who made an emergency call to an adult, teacher, the emergency number of the regional hospital, to a medical professional or to the closest Health Facility to the incident. The proportion of people who received help. The proportion of persons whose bleeds or LTBs were alleviated or attended to or who were referred for better management. Furthermore, the intention to treat/carryout the desired first aid act in the phase of an acute incident requiring FA. Lastly, we would like to evaluate the number of students who perform well during the scenarios to evaluate the need for knowledge revamping/refresher course on the aspects of FA taught. And all these, we shall compare the outcomes between the intervention and control groups.

3.7 STUDY VARIABLES AND TYPE

Variables

Outcome variables

1. Knowledge Change: to determine whether or not there was an overall change in knowledge before and after the training (dichotomous).
2. Test scores: to measure the educational efficacy of the first aid training before and after the intervention in comparison with the control group (continuous)
3. Self-efficacy ratings: Participants' self-perceived efficacy in performing first aid skills or their confidence levels in “Stopping the bleed and/or calling for help” (dichotomous)

4. Response time: The time taken by participants to respond to simulated first-aid scenarios or emergencies that require them to either stop an LTB or call for help or refer (continuous).
5. The number of participants who make use of the skills taught during the 3 months post-training but before the final assessment (Discrete).

Exposure Variables

The exposure variables include training on LTBs from injury first aid and the use of these services by the trained students (e.g., the number of persons assisted or referred during the follow up period of the training).

3.8 DATA COLLECTION TOOLS

A) Questionnaire

Pre- and Post-Implementation of a Young First Aiders (YoFA) Training Program Amongst Early Secondary School Children on Injury and Trauma First Aid in Fako Division.

Health District_____ Date: _____

Secondary School_____ Class: _____

A) QUESTIONNAIRE

Section 1

Please answer the questions below by **ENCIRCLING OR WRITING** the right answer you think is correct. If you do not know an answer, please select the answer you think is correct.

1. **Gender** **YES** or **NO**
2. **Age** *(in years):* _____
3. **Parents' Occupation:** Father_____ Mother_____
4. **Do you have access to a mobile phone all the time?** **YES** or **NO**
5. **Have you heard the words First Aid?** **YES** or **NO**
6. **Have you ever seen a traumatic injury?** **YES** or **NO**
   (A traumatic injury is an injury you sustain when something outside your body causes you to lose function or render you unable to use part or all of your body because of pain, bleeding or the because it is very serious)
7. **A) Have you ever received any training in First Aid (formal or informal)?** **YES** or **NO**

   B) If yes, briefly describe the training *(where was it, what did you learn? How long ago was it?)*
   Where? _____
   How long ago?
   a) < 6months ago
   b) 6 to less than12 months ago
   c) 1 to 3 years ago
   d) >3 years ago
   What you learnt?

   _____

   _____
8. **Have you ever seen someone bleeding and tried to stop that bleed yourself at home, school, marketplace, or anywhere else?** **YES** or **NO**
   B) How many times has that happened? *(Choose one)*
   a) Never
   b) Just once
   c) 2 to 5 times
   d) >5 times

C) What did you do to stop the bleeding? _____ **YES** or **NO**

_____

_____

D) Did it work? **YES** or **NO**

9. **A) Do you remember watching other people do this in the past?** **YES** or **NO**
   B) Have you ever watched someone else offer such help in question 5? **YES** or **NO**
10. **If you find someone bleeding today,**
    A) Will you help them? **YES** or **NO**
    B) If 'no', why will you not help?
    a) I don't know what to do
    b) I am afraid I will make it worse
    c) I am afraid I will get into trouble
    d) I am afraid of blood
    e) Other reason _____
    C) If 'yes', why will you help? _____
    _____
    D) What steps will you take to help if 'yes'?
    a) Help by putting in toothpaste
    b) Help by applying pressure on the wound
    c) I will not help
    d) I will call an elderly person.

    B) If you would not help, what makes you not want to help?
    _____
    _____

11. **A) Is there a functional infirmary/dispensary/sickbay in your school?** **YES** or **NO**
    B) Do you know where the closest/nearest health centre/hospital/clinic is to your house? **YES** or **NO**
12. **What will motivate (encourage/push) you to carry out a First Aid act to help someone in need? (***Select all that apply***)**
    a) Encouragement from your family to learn the FA skills and apply what is learnt
    b) Encouragement from your peers/friends/classmates
    c) What your neighbours, quarter head, or teachers think/say about you being a YoFA.
    d) You see it on social media or TV
    e) Getting more training
    f) You want to be a first responder
    g) Others._____
13. **A severe/serious accident happens in front of you, and you must call an ambulance. What do you have to do? The pictures below show the actions you need to take, but they are in disorder. Rearrange them in order according to which one you will do first. Write the numbers 1 to 3 in the images according to what you will do first to what you will do last.**

a) b) c)

14. **What would you do if your friend hurts his/her head lightly?**
    a) You immediately tell your friend to get up and continue your game.
    b) You put toothpaste on your friend's wound.
    c) You help your friend sit on a chair and ask if he/she is dizzy.

15. **What would you do if, while playing with your friend, he/she gets injured seriously/severely?**
    a) You help your friend get up.
    b) You run away to avoid punishment.
    c) You call for help and do not move him/her.

16. **What would you do if your friend injures his/her palm and the wound is slightly bleeding?**
    a) You apply pressure to the wound with a gauze pad or clean cloth.
    b) You wipe the blood with your hand.
    c) You apply toothpaste to the wound.
17. **When calling an ambulance, you must press/dial:**
    a) 118
    b) 117
    c) 119
18. **What should you say on the phone when you call an ambulance or call for help?**
    a) Your name and description of the accident.
    b) Describe the accident.
    c) Your name, the location of the accident, a description of the accident, and the number of injured people

Section 2:
"Life-threatening bleeding" (LTB) is an emergency. It is an injury or wound that should be cared for first because the loss of blood is great enough that the person will die if no first aid is given or delayed. Keep this in mind as you answer the following questions.
<u>Meaning of some difficult words</u>:

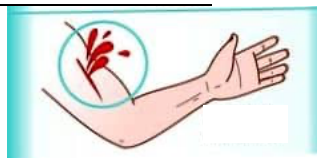
- **Spurting**: to flow out suddenly and with force, often in a fast stream
- **Streaming**: run or flow in a continuous current in a specified direction
- **Oozing or Trickling**: For a small amount of liquid to flow slowly out of something through a small opening or hole
- **Gushing**: flowing out suddenly, forcefully, or in large volume, as fluid that has been confined

This section is about being able to identify LTB (Life Threatening Bleeding) from a variety of descriptions *(You can choose more than one answer)*

19. **Which of the following need immediate first aid to stop the bleeding:**

a) Illustration of Blood oozing from scraped/scratched knee

b) Illustration of Blood spurting from arm



c) Illustration of Blood pooling on the ground

d) Illustration of Blood gushing from amputated foot

20. **Which of the following does not need immediate first aid to stop the bleeding:**

a) Spurting/pulsating blood from the injury
b) Streaming blood from the injury
c) Oozing/trickling blood from injury
d) Gushing blood from the injury

21. **Which of the following need immediate first aid to stop the bleeding:**

a) Photo of Scrape from a fall

b) Photo of full-thickness burn

c) Photo of Cut to thigh

d) Photo of Spurting blood from a forearm

22. **Which of the following need immediate first aid to stop the bleeding**:

a) Blood spotting through one piece of gauze
b) Blood-soaked clothing or bandages
c) Bleeding that is not soaking through a bandage
d) The overlying clothes are soaked in blood

23. **Which of the following need immediate first aid to stop the bleeding:**

a) Pooling of blood on the ground
b) Enough blood to fill 1/2 a soda can
c) Two-tablespoons of blood from the injury on the ground
d) A hole in the skin without flowing blood

24. **Which of the following need immediate first aid to stop the bleeding:**
    a) Dripping blood from a cut
    b) Gushing blood that will not stop coming out, even with a hand pushing on it
    c) Flowing blood from an injury that you are pressing on
    d) Blood spotting through several layers of cloth

25. **Rank the following: 1= at the top, most likely to die-- 4= at the bottom least likely to die**
    a) Bleeding from a person who is now unconscious
    b) Bleeding from a person who is not alert/not fully awake anymore
    c) Bleeding from a person who is now confused/not acting normally
    d) Bleeding from a person who is now pale

A tourniquet is a device that, when properly applied, stops blood from flowing by compressing blood vessels to a bone. [representative photos of a commercial Combat Application Tourniquet and an improvised tourniquet, both placed on a forearm]

26. **A tourniquet can be applied to a LTB in which of the following areas? (***More than one answer)*
    a) Leg
    b) Arm
    c) Hand
    d) Stomach

27. **Which of the following need a tourniquet applied to save the life** *(one answer **ONLY**):*
    a) Scrape/scratch from a fall
    b) full-thickness burn
    c) Cut to thigh
    d) Spurting blood from leg

28. **A tourniquet may be required for an arm/leg that is partially or fully torn off.**
    a) True
    b) False

This next section is about the actions of using pressure and tourniquets to stop LTB.

29. **Climbing over a fence, a person cuts their stomach; it is bleeding and 3-4 inches (7-10cm) long. To control bleeding from this wound, you should:**
    a) Apply firm pressure with your hand directly where the bleeding seems to be coming from
    b) Apply a pressure dressing first, then apply manual pressure over the pressure dressing
    c) Apply an elastic bandage around the abdomen, ensuring that the wound is covered
    d) Apply a cold pack to the wound

30. **If you are alone with somebody who is not awake and has LTB coming from an arm/leg, what best describes your first action(s)?**
    a) Call for help on a cell phone
    b) Put a tourniquet on the injury
    c) Call for help while apply pressure or placing a tourniquet (i.e., speaker phone, yelling, activating alarm)

31. **Put the tourniquet above the wound so that it is between the torso/body and the wound.**
    a) True
    b) False

32. **After placing the tourniquet above the injury, it is critically important to tighten it as much as possible before turning the stick/rod.**
    a) True
    b) False

33. **You have applied a tourniquet to a LTB on a leg. The bleeding appeared to stop initially, but has now restarted. Which of the following should be the next step:**
    a) Apply a second tourniquet above the first (between the first tourniquet and the torso)
    b) Check to see if the tourniquet has loosened and tighten the tourniquet by turning the windlass/rod more
    c) Loosen the tourniquet, then reapply closer to the wound
    d) Remove the tourniquet completely and apply a different type of tourniquet
    e) Apply a second tourniquet directly on top of the first tourniquet

34. **If the person is in pain, the tourniquet is on too tight.**
    a) True
    b) False

35. **When should a tourniquet be removed?**
    a) A tourniquet should never be removed unless instructed by a physician or EMS provider
    b) When the patient begins experiencing severe pain
    c) When a first responder arrives on scene
    d) When bleeding has stopped

36. **When packing a bleeding injury, it is important to push material as close to the bleeding vessel as possible**.
    a) True
    b) False

37. **After packing an injury to stop bleeding, it is not necessary to apply pressure any more.**
    a) True
    b) False

38. **How exited are you about learning this training?**
    a) Not excited at all
    b) A little excited
    c) Excited
    d) Very Excited

B) FGD and in-depth interview Guide for teachers, Parents and administrators

Welcome dear parents/ teachers

We just introduced a plan to implement a First Aid Training program designed to teach 10 to 14 years old (forms 1 to 3) stop life threatening bleeds to avert complications and to build a first aid culture in them as they grow up. In order to improve this program and understand whether this will be a beneficial program in this community, we are asking you, the parents and teachers of the students at this level, to participate in a focus group discussion about the proposed project. We want to understand your thoughts and concerns and hear your reactions to the project and to one another. We will ask you to sign a permission slip allowing us to record and transcribe the discussion, however, there will be no way to link what was said to you and your opinions will have no effect on your you or child, their grades, or any other consequence. We will use the data to strengthen the program and to help us decide whether training students is a good way to improve care for bleeding. This research is being done in conjunction with the University of Buea and University of California Los Angeles as well as the National Institutes of Health. Are there any questions? If you have any questions or concerns, please contact Dr. Vanessa Tabe at **+237672631065** anytime during or after the study.

I am turning the tape recorder on [CLICK]

Does everybody agree to participate in this interview?

1. First, what are your general impressions of the YOFA program as described?
2. What do you see as the benefits for children this age?
3. What do you see as the shortcomings of this program for children this age?
4. What do you see as the benefits or shortcomings of YOFA on the broader community? How likely is it that a program using children this age will make the community safer / more prepared to face traumatic injuries?

Possible Barriers and Concerns

5. Are there any practical barriers or concerns to bringing the bringing YoFA training into schools among 10- to 14-year-olds? If yes, what are some of them? (That may be parental consent, curriculum integration, teacher training and student involvement).

6. How do you suggest these barriers/concerns might be overcome or improved?

Program design and delivery

7. What practical training parameters are important to you as a parent or teacher to make this training easy and safe to conduct? (Length, frequency & type of ttraining)?
8. What role do you think parents and teachers should play in the implementation and ongoing support of the program?

Closing

Thank the participants for their valuable feedback and input.

Reiterate the importance of their perspectives in shaping the development of the "Stop the Bleed" young first aiders program.

Provide information on next steps and how the feedback will be used.

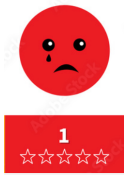
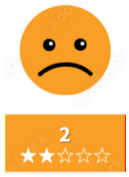
Interview Guide and FGD Guide for students

Opening of the interview with an ice-breaker question to put the students at ease, such as:"What are your thoughts on first aid training in schools?

1. What are your thoughts and feelings about starting a "stop the bleed" program for young first aiders in your school?
2. How do you think a program like this could help students your age, and what makes you feel that way?
3. What are some ways you think having classmates trained in basic bleeding control techniques could be helpful for everyone?
4. What worries or questions do you have about starting this program, and how do you think we could work together to solve them?
5. How do you imagine your friends would feel about the chance to become young first aiders, and what do you think might encourage or stop them from wanting to join?
6. In your view, what skills or information do you think are really important to include in the "stop the bleed" training for students like you?
7. What ideas do you have for making the program fun and interesting so that everyone wants to participate and learn?
8. How do you think having a "stop the bleed" program could change how your school thinks and acts about being prepared for emergencies?

C) ADAPTED SYSTEM USABILITY SCALE FOR THE YOFA TRAINING PROGRAM

Kindly indicate with the smileys below whether you think you will use the YoFA Skills learnt

1 = **Strongly Disagree** with the statement made	**2** = **Disagree** with the statement made	**3** = **Neutral** you neither agree nor disagree to the statement made	**4** = **Agree** with the statement made	**5** = **Strongly agree** with the statement made
				

ITEM	Value per 5-point Likert scale response, n (%)				
	1	**2**	**3**	**4**	**5**
1. I feel that I can know what to do with the YoFA skills if I see someone in need					
2. I found the skills taught too complicated to use.					
3. I thought the skills were easy to use.					
4. I think that I would need help from the staff to be able to use these skills.					
5. I found the training topics in the YoFA skill set to be strongly related/closely associated to each other.					
6. I thought there were too many changes/ups and downs in the skill set taught					
7. I would imagine that most other children of my age would learn to use these skills very quickly.					
8. I thought the skills were really hard to use.					
9. I felt very confident using the skill set.					
10. I needed to learn a lot of things before I could start applying the skill set					

3.9 DATA COLLECTION PROCEDURE

The qualitative data will be collected through FGD and in-depth interviews of the students and a simulation exercise. Interviews will be done using an interview guide until we reach a point of saturation. Each interview will last about 30 minutes.

Quantitative data will be collected on **three** first aid variables: first aid knowledge, practical skills, and helping behaviour (attitude) using pre and posttest questionnaires composed of multiple-choice questions. This will be done using an adapted evidence-based pretested tool called "Stop the Bleed" Education Assessment Tool (SBEAT)[20] in adaptation with the LFRs training tools.

3.10 DATA MANAGEMENT AND ANALYSIS

Quantitative data will be collected using interview-administered questionnaires in Kobo collect, then stored in coded excel sheets to be analyzed using R software.

Qualitative data will be transcribed and coded into transcripts to be analyzed using codes in Atlasti.

3.11 DATA ANALYSIS PLAN

A difference-in-difference analysis would be done to assess the change in KAPs before and after the intervention in. The posttest would be done immediately after the 4 days of training for each pool and 3 months after the training to assess the need for refresher course planning.

The exposure variables include training on LTBs from injury first aid and the use of these services by the trained students (e.g., the number of persons assisted or referred during the follow-up period of the training).

We will analyze survey data using R Software with a combination of descriptive statistics and parametric and non-parametric tests to establish statistically significant differences between pre- and post-test results and between the intervention and control groups.

Table 7: Objectives and their Indicators

Objective	**Activities/process**	**Data collection tools**	**Data Source**	**Indicators**
1. To understand the perspectives of stakeholders on YoFA training program among SSC	- In-depth interviews	-In-depth interview guides	School teachers, administrators, parents, community leaders and students	-
2. To assess school children's KAP (willingness and self-efficacy on trauma/injury FA via the built YoFA training to stop LTBs.	- survey	-Questionnaire	- students	- Obtain baseline KAP Scores
3. To evaluate the effectiveness and usability of the YoFA training program for SSC to respond to LTBs safely and promptly in their environs.	-Training following a specific STB and LFRs program -Training students on specific modules of LTB FA - Pre and post test -Simulation exercises	- Use adapted tools from the SBEAT - Questionnaires - Evaluation form with questions how? What was the situation?where, and how?	Stakeholders, teachers, parents, students	- Change in knowledge scores -At least 50% of stakeholders rate the program as good/ expectations met - 70% of students rate the program as good/expectations met - Number of children who made use of the FA skills taught
4. To determine the barriers associated with implementing theYoFA program among early SSC in the Fako Division.	- Interviews - Survey	-Interview guides - Questionnaires	- Stakeholders, - Teachers, students	- Perceived reasons and challenges that hinder FA training in schools.

3.12 ETHICAL CONSIDERATIONS

This research will prioritize the ethical principles of informed consent, confidentiality, and respect for participants. All participants will be informed about the purpose of the study and their right to withdraw at any time. Parental consent will also be obtained from the students before carrying on with the trainings. Confidentiality of information obtained from participants will be strictly maintained, and ethical approval will be sought from the institutional review board of the Faculty of Health Sciences of the University of Buea.

NB: Following the research study, all the children within the various schools will be retrained on the program to ensure equity.

Potential risks and Mitigation Strategies

Risks	**Mitigation Strategies**
Breech in confidentiality	No names on the pre and post-tests, only initials to be able to measure the degree of KAP change, no other potential respondent will come in contact with the filled questionnaires
Loss of time	-The tests are administered by data collectors using filling will be faster Duration: 30mins only. -For the qualitative part, the participants will be informed ahead of time so that their convenience is met.
Psychologic risks related to filling of the questionnaires or taking tests and responding.	Questions in the tests will be simply focused on what will/has been taught and in very simple languages with explanations given to the entire group at once if clarifications needed. Respondents will be counselled prior to the interviews and be given liberty to back out at any moment.
Difficulty interacting during interviews since some people are not used to being recorded.	Interviews will be performed at convenience of the interviewee. The interviewees will also be allowed to ask questions and the research team will answer all questions in line with the study.

Potential Benefits

For the Participants:

- They will be first in the secondary schools in the Southwest to benefit from such knowledge and skill set.
- They will have the opportunity to apply the knowledge and skills learnt among their peers and the communities where they live.
- They shall each benefit from a transport for the evaluation phase.

The population:

- They shall be the first to benefit from such services in the advent of traumatic injuries and these will be free of charge.
- They will contribute ideas to help improve on the YoFA program.

The country:

- The educational and health systems can leverage on this program to build a comprehensive FA curriculum for schools and other institution to raise a FA culture and alleviate adverse outcomes of traumatic injuries.

Measures taken for data confidentiality and respect for the private lives of the participants

- There are no names on the questionnaires, and no other parents will have access to the questionnaires.
- Questions posed will solely be related to the study.
- We will use codes to input and analyse the data and only the data mangers (2) will have full access to the coded file where data is managed.

- Informed and parental consent will be obtained from participants prior to the study
- Informed consent will be obtained from interviewees in person before the interview.
- Administrative approval will be obtained from the various schools, regional delegations, and districts and ethical clearance from the ethical committee of the University of Buea.

CHAPTER FOUR

EXPECTED RESULTS

Overall, we expect to be able to determine perceptions of stakeholders regarding introducing a YoFA training program in early secondary schools, determine effectiveness of the program and usability of the skills taught, as well as identify challenges in implementing the program. The study will equally help us to reasonably and measurably improve KAP of early SSC on injury and trauma first aid basics, particularly in life threatening bleeds. We equally hope to determine the outcomes of this intervention and propose solutions as to how we can overcome the barriers identified.

The results will inform policymakers, educators, and healthcare professionals about the need for targeted interventions in first-aid training programs in schools. Additionally, the study will contribute to the existing literature on first aid training in low-resource settings, particularly focusing on the Sub-Saharan African context.

The expected results will be used to determine the scalability of the intervention and its incorporation into public health and educational policies in Cameroon to foster intersectoral collaboration and overall, lower morbidity and mortality from injury/trauma events.

4.1 LIMITATIONS

Data source (DHIS 2) to enable the choosing of the districts with the highest number of trauma and injury cases may not be accurate due to the poor and incomplete reporting of trauma and injury cases in the system.

Private schools were not involved in the study given that they have slightly different school programs from the rest of the public schools.

INFORMATION NOTICES version 1.0_15/11/2024

I. FOR PARENTS and Teachers of form 1 to 3 students (10 to 14 year-olds)

Title of the Study: **Pre- and Post-Implementation of a Young First Aiders (YoFA) Training Program Amongst Early Secondary School Children on Injury and Trauma First Aid in Fako Division**

By ***Vanessa Tabe Orock-Benem, MD; MPH (See address and tell below)***

This notice is an invitation to participate in research that will enable children in early secondary school (form 1 to 3) be trained on basic first aid skills to identify and stop or refer life threatening bleeds (LTB) from traumatic injuries around them at school or their neighborhoods.

Research objective: To gain insights into the perceptions and barriers surrounding a Young First Aiders' (YoFA) training program on trauma/injury first aid in both the school setting and the community in the Fako Division. Also, it wants to assess and measurably improve Knowledge, Attitudes and Practices (KAP) of early Secondary School Children (SSC) on trauma/injury FA using the YoFA training program. The research aims to determine the Knowledge, attitudes and practices (KAP) of FA, identify the challenges of implementing first aid training, evaluate its effectiveness, and usability of skills learnt among the SSC and the community among children aged in Fako division, Cameroon.

Period of the study: A 10-month study from November 2024 to September 2024.

Study population: Secondary school children aged 10 to 14 years old (Form 1 to 3), Parents and school administrators/teachers and some community members.

Procedure: The research team will meet with parents during PTA meetings organised by the school. Here, the content of the intervention will be explained in more detail to parents and school administrators/teachers.

During this meeting, appointments will be taken with parents to perform in-depth interviews regarding their perceptions about introduction of a YoFA program and their ideas of the content of such a program for children. Following the selection of specific children randomly in the classes concerned, and after obtaining from their parents using the ascent forms, they will be trained for 8 hours on 4 consecutive days decided upon with the school. Then, after 3 months, the children shall equally be evaluated to see the amount of knowledge they still retained and whether or not they used the YoFA skills learnt during the three months.

No human specimens will be collected.

Refusal to Participate: Participating in this research is voluntary. All participants have the right to refuse to participate and the right to withdraw consent from the study at any time, without retaliation.

Ethical considerations:

Measures taken for data confidentiality and respect for the private lives of the participants

- There are no names on the questionnaires, and no other parents will have access to the questionnaires.
- Questions posed will solely be related to the study.
- We will use codes to input and analyse the data and only the data mangers (2) will have full access to the coded file where data is managed. Data will be and stored for up to 6months after the study, then destroyed.
- Informed and parental consent will be obtained from participants prior to the study

- Informed consent will be obtained from interviewees in person before the interview

Potential risks and Mitigation Strategies:

Risks	Mitigation Strategies
Breech in confidentiality	No names on the pre and post-tests, only initials to be able to measure the degree of KAP change, no other potential respondent will come in contact with the filled questionnaires
Loss of time	-The tests are administered by data collectors using filling will be faster Duration: 10mins only. -For the qualitative part, the participants will be informed ahead of time so that their convenience is met.
Psychologic risks related to filling of the questionnaires or taking tests and responding.	Questions in the tests will be simply focused on what will/has been taught and in very simple languages with explanations given to the entire group at once if clarifications needed. Respondents will be counselled prior to the interviews and be given liberty to back out at any moment.
Difficulty interacting during interviews since some people are not used to being recorded.	Interviews will be performed at convenience of the interviewee. The interviewees will also be allowed to ask questions and the research team will answer all questions in line with the study.

Potential Benefits

For the Participants:

We will raise a future of conscious children into adults who will have a heart to render First Aid services in the simplest way possible such as staying safe, calling for help or referring a patient who needs urgent care to prevent complications

They will be first in the secondary schools in the Southwest and probably all over Cameroon to benefit from such knowledge and skill set.

They will have the opportunity to apply the knowledge and skills learnt among their peers and the communities where they live.

They shall each benefit from a transport for the evaluation phase.

There will be an open career path to some of these children for the future in emergency medicine and other fields of medicine and community service.

The population:

The Community's awareness on the need to invest in First Aid (FA) will be increased.

They shall be the first to benefit from such services in the advent of traumatic injuries and these will be free of charge.

They will contribute ideas to help improve on the YoFA program.

The country:

The educational and health systems can leverage on this program to build a comprehensive FA curriculum for schools and other institution to raise a FA culture and alleviate adverse outcomes of traumatic injuries.

Compensation: No compensation will be given to participants except the transportation of the students during the evaluation.

ADDRESSE

- **Principal Investigator: Vanessa T.O.B.; MD, MPH**
- **Bonduma Gate; Buea – Cameroon.**

- **Email: vanessatob@gmail.com Tel: 658005255, 672631065**

CONSENT FORMS

version 1.00_15/11/2024

PARENTAL CONSENT for children to be included in the study (10 – 14 years)

I, the undersigned, Mr / Mrs / Miss
(Surname(s))_____ and First name (s) _____, Mother/Father/Carer/Tutor of Mr/Ms_____.

Having been invited to participate in the research work entitled "***Pre- and Post-Implementation of a Young First Aiders (YoFA) Training Program Amongst Early Secondary School Children on Injury and Trauma First Aid in Fako Division*** ", whose Principal Investigator is Vanessa Tabe Orock-Benem, from the Faculty of Health Sciences, University of Buea.

- I have understood the information notice given to me concerning this study. ☐
- I have been read and explained the information leaflet relating to this study. ☐
- I have understood the purpose and objectives of this study. ☐
- I received all the answers/explanations to the questions I asked physically via phone calls. The risks and benefits were presented and explained to me. ☐
- I have understood that my child is free to accept or refuse to participate in it. ☐
- His/her Ascent does not relieve the research investigators of their responsibilities, my child preserves all of his/her rights given by the law. ☐
- I retain all my rights guaranteed by law. ☐

I freely agree to give ascent of my child in this study under the conditions specified in the information notice, that is to say (for example):

- Allow my child to be a Young First Aider (YoFA) on basic First aid skills to identify and manage or refer life threatening bleeds.

Done at……..…on the……/……/……

The Principal Investigator (names and address) The Participant (name and address)

Tabe Orock-Benem Vanessa; 672631065

vanessatob@gmail.com

INFORMED CONSENT FOR PARENTS/Administrators/Teachers

version 1.00_15/11/2024

I, the undersigned, Mr / Mrs / Miss (Surname(s)) _____ and First name(s) _____.

Having been invited to participate in the research work entitled "***Pre- and Post-Implementation of a Young First Aiders (YoFA) Training Program Amongst Early Secondary School Children on Injury and Trauma First Aid in Fako Division*** ", whose Principal Investigator is Vanessa Tabe Orock-Benem, from the Faculty of Health Sciences, University of Buea.

- I have understood the information leaflet given to me concerning this study. ☐
- I have been read and explained the information leaflet relating to this study. ☐
- I have understood the purpose and objectives of this study. ☐
- I received all the answers/explanations to the questions I asked physically via phone calls. The risks and benefits were presented and explained to me. ☐
- I have understood that I am free to accept or refuse to participate in it. ☐
- My consent does not relieve the research investigators of their responsibilities. ☐
- I retain all my rights guaranteed by law ☐

I freely agree to participate in this study under the conditions specified in the notice of information, that is to say (for example):

- Participate in the in-depth interview with the research team which will be recorded or not.

Done at……on the……/……/…

The Principal Investigator (names and address) The Participant (name and address)

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Result Dissemination Plan

The results of the research will be shared with the wide public particularly the community of researchers in various journals, the institutions that granted administrative authorization and the Ministry of Public health through its Health Districts.

This will specifically be shared through publication in Scientific Journals and Reports. International spread will be important to enable philanthropists see the felt need of first aid in our setting and act accordingly to bolster overall health care in the world.

It will also be shared with the Ministries of Education so that they can consider incorporating First aid in the regular curriculum of schools.

Specific measures for vulnerable participants

Vulnerable participants will be attended to base on their vulnerability and resources available. For example, parents who are not literate cane make a phone call to the principal investigator before giving consent. Also, children who are blind will be read the questions. However, the schools selected are less like to have blind students there in

Alongside the school, the research team will determine ways to manage vulnerable participants without giving room for biases of any kind.

Procedure and framework for soliciting informed consent

Informed consent will be obtained from parents via two main ways:

- During Parents' Teachers Association (PTA) meetings where the consent forms will be read together with the parents before they can give their consent. OR
- Via mails (Letters in envelops) sent to parents through the children with a specific date of return. The envelops will contain the information notices and the consent forms where in the contact and address of the PI will be noted in case parents needed more clarity.

TIMELINE

Table 5: Timeline

	2024			2025						
Program Activities	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**July**	
Ethical & Administrative Approvals and parental consents										
Preparation and validation of curriculum										
Training of trainers										
Training data collectors										
Training of Students										
Qualitative										
Quantitative										
Data management and Analysis										
Monitoring and Evaluation										
Reports Writing/Presentation										
Positioning for Publication (Manuscript)										

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