Somali Multidisciplinary Academic Journal (SoMAJ)

ABOUT Us

The Somali Multidisciplinary Academic Journal (SoMAJ) is a multidisciplinary journal with the goal of disseminating forward-thinking research in a variety of areas of study in the fields of Health sciences, Engineering & Technology, Social Sciences, Agriculture & Environmental science, Economics & Management Sciences and Sharia & Law those support national developmental Agendas.

The SoMAJ's major goal is to provide a forum for researchers & Academicians to share their research findings with its concerned respected authority.

The contributions may be theoretical or applied and should be written in English.

Academicians, junior & senior Researchers are currently the target contributors of SoMAJ, hence all papers submitted should be in line with the guidelines set by the SoMAJ.

EDITORIAL TEAM

EDITORIAL NOTE

In the academic community, Himilo University is well-known for its academic excellence and serious dedication to knowledge dissemination.

The University recognizes the importance of research in education and is devoted to cultivating an interest in it. In this quest, the University has taken the initiative to publish a new Journal titled '- Somali Multidisciplinary Academic Journal (SOMAJ)' in order to inspire Researchers and Academicians.

It is an annual journal dedicated to publishing academic research papers and articles written by researchers on current topics and issues in the fields of health sciences, engineering and technology, social sciences, agriculture and environmental science, economics and management sciences, and Sharia and law, among others.

To ensure high academic standards, academic ethics, and academic integrity, each manuscript received for publication by the Committee on Publication Ethics is subjected to a rigorous procedure of double-blind evaluation of research papers.

The first edition of the journal, "SOMAJ Volume 1, 2022," was successfully launched on December 21st, 2022.

I would like to congratulate all of the researchers whose research papers have been published in this issue of SOMAJ and offer my heartfelt gratitude to the Advisory Board and Editorial Team.

Dr. Abdullahi Osman Yusuf (Naaji)
Chief Editor

Digital Education As A Future Sustainable Development Goal

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Abstract

The rise of digital technologies has impacted all aspects of society, from business to education. To meet the difficulties of the digital transformation, our younger generation's ability to learn and make decisions based on such interpretations is becoming increasingly critical. Therefore, future generations of students will need to be prepared with the required digital skills to meet the challenges of a digital society.

In higher education, digital transformation refers to how digital tools deliver value and drive change. This paper will look at the importance of digital education as a future goal of sustainable educational development.

Keywords: Digital technologies, digital education, e-learning, IT Infrastructure,

Introduction

Sustainable development education is one of the key motivators that can aid in achieving the Sustainable Development (ESD) in Sustainable Development Goals (SDGs). ESD is an interdisciplinary educational strategy that encompasses the formal and informal curricula's integrated social, economic, and environmental components. (UNESCO, 2020).

The interdisciplinary nature of learning and teaching can strengthen and re-energise knowledge. This could lead to supporting and empowering learners, teachers, administrators, and researchers to understand sustainability issues' systemic and global nature and their role in pursuing change for a more just, prosperous, and sustainable society. (Issa-Salwe, 2020)

Digital education is a powerful tool for helping ESD meet current and future needs for integrating SDGs into all forms and levels of education. (Kohler. 2022) It responds to the changes and challenges of developing transformative pedagogies, learning environments, content, and learning outcomes that can contribute to a more resilient society. (Idil Osman, 2012)

Despite the interconnectedness and links underpinning digital education and ESD, it must recognise the general issues that digital education faces and the impact technology can have on learning for sustainable futures.

The new ESD2030 strategic direction emphasises the need to expand and improve how digital education and technologies may be used to change people's behaviour and mindsets regarding sustainability. (UNESCO, 2020) In order to expedite efforts and measures that help young people acquire the knowledge, skills, values, and attitudes necessary to promote

and construct a sustainable development that seeks to fulfil the 17 SDGs, the significance of developing inclusive educational opportunities is also emphasised. (ibid)

This special issue aims to give researchers from various disciplines, including the humanities, the opportunity to share their ideas, practices, and research on developments in digital education and ESD and how they can help achieve the SDGs in education. (Freeman, 2022)

The special issue also aims to contribute to the conversation about how digital education and technologies can improve ESD practices, learning environments, pedagogies, and content in all forms of education. It also aims to mobilise people to take appropriate actions that lead to sustainability in all aspects of life. Finally, it critically considers the problems, risks, and emergencies that digital education phases in ESD.

According to Freeman (2022), in higher education, digital transformation refers to using digital tools to deliver value and drive change. Technology should be used to enhance and change how things are done, not just for utilising it. The diversified digital ecosystem is impacting— and evolving — practically everything done by humans, and digital transformation embodies the cultural, workforce, and technological transition currently underway. (ibid.) It focuses on harnessing technology to advance advances in core strategies and operational difficulties rather than on specific tactics or software.

The digital revolution, or technology-enhanced learning or e-learning, is the everyday use of digital tools and technologies in teaching and learning. Exploring digital technology can help teachers create engaging learning opportunities in their textbooks and programmes, whether blended learning or wholly online. (Idil Osman, 2012)

According to EU future policy (EU Commission, 2021), the EU digital education plan is directed to the following two priorities:

1. Developing a high-performing digital education ecosystem (ibid.):
   a) Creating infrastructure, connectivity, and digital equipment are all things that must be considered.
   b) Planning and developing digital capabilities, including organisational capabilities
   c) Providing high-quality learning content, user-friendly tools, and
   d) Helping secure platforms that respect e-privacy legislation and ethical standards for digitally capable and confident teachers and education and training professionals.
2. Enhancing digital skills and competencies for the digital transformation requires the following steps (ibid.).
   a) Providing basic digital abilities and competencies from a young age through digital literacy, including dealing with misinformation and computing education.
   b) Enhancing digital skills that can develop more digital professionals, including knowledge and comprehension of data-intensive technologies such as artificial intelligence (AI),

What Does Digital Transformation Mean for Higher Education?

When considering digital transformation in higher education, it is crucial to consider the pandemic's influence. The quick use of virtual education, resources, and gatherings shifted expectations and hastened the adoption of digital tools. As a result, the pandemic has

presented an opportunity for higher education leaders to seize in many ways. (Kohler et al, 2022)

The pandemic was an opportunity for digital change as it proved that it was supposed to have the means to substitute face-to-face learning. As a result, digital learning has become an essential tool for higher education institutions to survive. (Issa-Salwe, 2020) Digital transformation has allowed teachers to simplify understanding by enabling students to focus their energies on their knowledge.

Trends In Current Digital Transformation

Digital transformation impacts two primary business areas: services and operations. This transition entails the development of new items and the modification of existing ones. For example, offering an online master's program or transitioning from physical textbooks to digital eBooks are two services. In addition, artificial intelligence (AI) gadgets throughout campus can answer issues such as where the lab is located or when the clinic closes, which can be helpful for first-year students still getting to know their way around campus. (Freeman, 2022)

Another significant feature is using technology to manage the registration and admissions processes and monitor resource allocation. Data-driven decision-making can serve as the foundation for digital transformation with the support of an automated and secure analytics program. These patterns reflect how colleges and universities can enforce and implement their digital transformation initiatives.

How to Develop Digital Transformation Best Practise

Many views about critical components must be in place to successfully move to a digitally transformed campus. The one thing that is noted across the board is that leadership matters. However, leaders might only need to know some details about making a change. Nonetheless, they need to raise awareness of how vital the transformation is and what it will take to get an organisation behind it.

Leaders who champion transformation are the key to the thriving culture shifts required to become a digital-first organisation. Without leadership firmly supporting the endeavour, it would be easy for projects to get scrapped in favour of an "old reliable" way of doing things.

According to Freeman (2022), mapping digital strategy centres on problem-solving innovations in service of the university mission – should be the starting point for the revolutionary move to digital-first. It should be based on business requirements rather than the newest vendor presentations.

Digital projects must be built based process transformation and "consumer" participation to guarantee efficiency and quality standards from the outset. Students are the clients in higher education. Private versus public colleges, online versus on-campus education, and full-time versus part-time enrolment are just a few of the possibilities available to them. (ibid,)

With the number of higher education institutions on the rise and the number of college-ready high school graduates declining, the need to compete for students has never been more

critical. This generation demands hyper-personalised content that targets their location and situation and flawless cross-device interaction. (Freeman, 2022).

According to Freeman (2022), when an institution considers digital transformation, it must realise that it might be focused on one of four areas:

1. Transformation of the business process
2. Transformation of the business model
3. Transformation of the domain
4. Transformation of the cultural/organisational environment

All four transformations are required, and they must work effectively together.

Most higher education institutions may follow a corporate model in their digital transformation. That model refers to business operations or data (or the analytics surrounding data collection) that save costs, shorten cycle times, or improve quality.
The business model reveals fundamental functionalities such as blended or hybrid delivery, self-paced learning, and competency-based forms. Many institutions accelerated their efforts in this area due to the pandemic.

Business model transformations target the core components of the value delivery process, whereas firm process transformations concentrate on specific areas of the business.

When a company successfully spins around into a new area, it is called 'domain transformation'. They will eventually expect the same ease and security when paying for higher education. While higher education organisations will continue focusing on instruction, several universities' digital roadmaps already include tertiary services that fulfil student expectations. (UNESCO, 2020

In many respects, cultural or organisational transformation is the bedrock of digital transformation. This transition necessitates leadership, teamwork, courage, emotional intelligence, and other change management techniques. Additionally, it calls for a strong emphasis on change management, a laser-like concentration on progress towards institutional goals, and an increase in institutional agility and adaptability to handle rapidly changing needs. (ibid.) Successful projects will also support a culture that is open to change.

Finally, digital transformation can be done in stages, as a university can benefit from automating as much as possible. However, the shift to a wholly transformed campus will be influenced by improved digital talent, the culture change required to welcome digital efforts, and the public benefits of automation.

The diversified digital ecosystem is impacting — and transforming — practically everything we do, and digital transformation embodies the cultural, workforce, and technological transition currently underway. It focuses on harnessing technology to advance advances in core strategies and operational difficulties rather than on specific tactics or software.

Startup for Digital Leadership

There must be a leadership shift for every transformation that can lead to the changes. There must be a foundation of leadership support for digital transformation. A paradigm shift to help the mindset will be required to make this move.

Digital transformation cannot be approached in a one-size-fits-all manner. A risk-management attitude is necessary for digital transformation. Successful digital transformation requires an understanding that technology is how to address tremendous difficulties and bring about widespread change. (Freeman, 2022)

Conclusion

Education for sustainable development (ESD) is a primary incentive for achieving the Sustainable Development Goals (SDGs). Because of its dynamic and interdisciplinary nature in learning and teaching, digital learning can support and empower learners, teachers, administrators, and researchers to understand sustainability issues' systemic and global nature. It can also help with the pursuit of prosperous and sustainable societies. Education for Sustainable Development (ESD) can help the future by making it digital, so education for sustainable development can be used as a powerful tool for assisting ESD in meeting future needs in integrating SDGs into all forms and levels of education. Digital educational sustainable development can help tackle the challenges of developing transformative pedagogies, learning environments, content, and learning outcomes that can contribute to a more resilient and sustainable world.

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Pattern and outcome of renal diseases in hospitalized patients at a tertiary hospital in Mogadishu, Somalia

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Pattern and outcome of renal diseases in hospitalized patients at a tertiary hospital in Mogadishu, Somalia

Over time, renal diseases have emerged as one of the world's leading causes of morbidity and mortality. Chronic kidney disease (CKD) has recently been recognized as a public health concern. Chronic kidney disease mainly affects low-income countries, especially Sub-Saharan Africa, where it strikes young adults and hinders economic growth. Hospitals in developing countries lack advanced equipment, leading to misdiagnosis and worsening kidney disease, increasing death rates [1].

The incidence of kidney diseases has been rising. The pri- mary risk factors for kidney disease, which frequently leads to kidney failure, are diabetes mellitus and hypertension. This emphasizes the significance of primary prevention of diabe- tes and hypertension in addition to early detection and quick therapy of renal diseases in high-risk individuals [2]. In Somalia, a country with a weak healthcare system and resources, scarcity of renal replacement therapy and renal biopsy, as well as limited accessibility to basic services, kid- ney diseases represent a serious threat to health. For individ- uals with kidney failure, hemodialysis is the only practical option, and its services are mainly found in large cities. Furthermore, Somalia has the lowest health and well-being indicators in the world and a high rate of morbidity and death overall [3].

Due to the lack of a national registry system, the preva- lence of renal disease in Somalia is still unknown, making it challenging to estimate the disease's overall impact on the population as a whole [4]. Since there is insufficient informa- tion on the causes of kidney disease, which is the precursor to kidney failure in Somalia, the aim of the study was to evaluate the pattern and outcome of renal diseases in hospi- talized patients in a tertiary hospital in Mogadishu, Somalia. We conducted a retrospective study at Mogadishu Somali Turkish Training and Research Hospital (MSTH) from January to December 2023. MSTH is a major teaching hospital in Somalia's capital, receiving patients from Somalia and neigh- boring countries. 483 adults with renal disorders admitted to MSTH's internal medicine unit were included. Patients with missing data were excluded. We examined how factors like age, health conditions, treatments, and tests influenced patient outcomes (recovery, death, CKD with/without dialy- sis). We collected patient data from medical records and ana- lyzed it using Epi Info. Descriptive statistics summarized the

data and chi-square tests assessed relationships between fac- tors and patient outcomes (recovery, death, CKD). *P*-values less than 0.05 were considered significant. The study was approved by the Mogadishu Somali Turkey Training and Research Hospital's IRB. Patient anonymity was ensured.

Older adults (≥60) had a higher prevalence of renal dis- ease. There were more males 63.1% than females, with emer- gencies being the most common admission source 62.7%. CKD with dialysis 57.8% was the most frequent outcome. The recovery rate was 23%, and mortality was 7.9%. Most stays were less than a week, 62.7% (Table 1).

Nearly 40% had no comorbidities, but hypertension was most common at 26.3%. Over half, 57.1%, had abnormal ultrasounds suggestive of kidney damage. Chronic kidney disease 61.9% was the leading diagnosis, followed by acute injury 38.1%. Key lab findings included low calcium 64% and sodium 54.7%. Urine analysis showed protein 56.9% and blood 45.6% in many patients, with 26.1% having sugar. Almost half, 46.6%, had urinary tract infections, while viral hepatitis was less common (HBV+ 4.4%, HCV+ 1.2%). There are no statistically significant differences in the mean values of creatinine across the age groups (Table 2).

The study examined factors like age, admission type, ultra- sound results, and diagnosis in patients with kidney problems.

Table 1. Demographic characteristics and outcomes of patients with kidney diseases in tertiary hospital, Mogadishu, Somalia, 2023.

Age	Frequency *n*=483	Percentage (%)
18–39	119	24.6
40–59	149	30.9
≥60	215	44.5
Gender		
Male	305	63.1
Female	178	36.9
Source of Admission		
Emergency	303	62.7
OPD	180	37.3
Outcome		
Chronic Kidney disease with Dialysis	279	57.8
Fully recovered	47	9.7
Chronic Kidney Disease without Dialysis	119	24.6
Died	38	7.9
Hospital Stay		
<1 week	303	62.7
1-4 week	172	35.6
>4 week	8	1.7

Table 2. Clinical and diagnostic features of patients with kidney diseases in tertiary hospital, Mogadishu Somalia, 2023.

Comorbidity	Frequency $n=483$	Percentage (%)
None	191	39.5
Hypertension	127	26.3
HTN, DM	53	11
Diabetic	37	7.7
Heart failure	37	7.7
Others	15	3.1
Cancer	9	1.9
HTN, HF	6	1.2
DM, HF	3	0.6
Polycystic kidney disease	2	0.4
Stroke	2	0.4
Nephrotic Disease	1	0.2
Ultrasound finding		
Renal parenchymal disease	276	57.1
Normal	148	30.7
Hydronephrosis	29	6
Renal atrophy	20	4.1
Kidney stone	10	2.1
Diagnosis		
Chronic Kidney Diseases	299	61.9
Acute Kidney Injury	184	38.1
Serum Calcium per mg/dl normal range (9-11mg/dl)		
Hypocalcemia	309	64
Normal	160	33.1
Hypercalcemia	14	2.9
Serum Sodium per mmol/L normal range (135-145mmol/L)		
Hyponatremia	264	54.7
Normal	201	41.6
Hypernatremia	18	3.7
Serum Potassium per mmol /L normal range (3.5- mmol/L)		
Hyperkalemia	225	46.6
Normal	205	42.4
Hypokalemia	53	11
Protein in Urine		
Proteinuria	275	56.9
Negative	208	43.1
Blood in Urine		
Hematuria	263	45.6
Negative	220	54.4
Glucose in Urine		
Negative	357	73.9
glycosuria	126	26.1
UTI		
Absent	258	53.4
Present	225	46.6
Viral Hepatitis		
Negative	456	94.4
HBV+	21	4.4
HCV+	6	1.2

Table 3. Association between factors and outcome of patients with kidney diseases at tertiary hospital, Mogadishu, Somalia, 2023.

Age	CKD with Dialysis	Recovery	Death	CKD without Dialysis	*P*-value	chi square
18–39	73	27	7	12	**0.05**	12.2
40–59	99	25	9	16		
≥60	107	21	24	27		
Gender						
Male	179	63	29	46	0.22	4.55
Female	100	48	15	15		
Source of Admission						
Emergency	177	62	31	22	**0.04**	8.01
OPD	102	48	7	23		
Ultrasound Finding						
Renal pranchymal disease	175	46	24	31	**0.002**	30.75
Normal	66	55	11	16		
Hydronephrosis	20	4	1	4		
Renal atrophy	13	2	3	2		
Kidney stone	5	4	0	1		
Hospital stay						
<1 week	170	66	28	39	0.46	5.6
1–4 week	104	44	9	15		
>4 week	5	1	1	1		
Diagnosis						
CKD	182	0	21	96	9.7	0.17
AKI	97	47	17	23		

They found that older age, emergency admissions, abnormal ultrasounds, and needing dialysis were linked to worse outcomes (chronic kidney disease with dialysis) (Table 3). On the other hand, being female and having normal ultrasounds were linked to a better chance of full recovery (p-values ≤0.05). Chronic kidney dis- ease was most common, followed by acute injury, similar to find- ings in a Ghanaian study [1]. In contrast, in many studies [5], glomerular diseases were their common finding. Although there is a difference between the target population in our study and theirs, the fact is that many developing countries, particularly in Africa, are sorely lacking renal biopsy in the practice of nephrol- ogy, which is a cornerstone in diagnosing, prognosticating and guiding the treatment of many renal diseases, especially glomerular diseases [6]. In accordance with a previous study, the majority

171 of our study participants were male, while most of our partic- ipants aged more than or equal to 60years; in contrast to the

study, Aslam et al. revealed that the majority of their participants were between 41 and 50years old. The difference might be the lifestyle variation, as most Somali people present as the last stage of the disease. In our study, a large portion of participants required renal dialysis, which was similar to the findings of Sylvanus et al. in Tanzania (42%) [8]. This highlights the fact that dialysis is expen- sive; however, it is the only option available in Somalia.

This hospital-based study provides valuable data on under-reported kidney disease in Somalia, revealing common causes and outcomes. However, focusing on a single hospital limits generalizability. Ideally, data from multiple centers would give a more complete picture.

In conclusion, chronic kidney disease was most common, often progressing to dialysis. Strengthening healthcare, pro- moting education, and ensuring equal dialysis access are cru- cial to improving patient care. Early diagnosis and treatment can prevent advanced kidney disease.

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The role of Media in driving Environmental and Climate Action: A Case Study of Mogadishu, Somalia

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About the author

Abdishakur Abdirahman Mohamud is a multifaceted multimedia storyteller with over 5 years of experience as a writer, reporter, and producer. As a distinguished freelance environmental journalist, activist, researcher, and sustainability educator, he brings a wealth of knowledge and passion to his work. Abdishakur is also a dedicated senior graphic designer and video editor, currently serving as the Head of the Environmental Department at RAAS Agribusiness Solution. With a Bachelor of Environmental Sciences from the Somali National University, his expertise was further recognized in 2023 when he received the first-place award in the Climate Storytelling Competition by BBC Media Action Somalia.

About the Reviewer

Mohamed Abdilahi is an Environmental Passionate, Climate Activists, environmental consultant, researcher, and trainer for different areas including climate change, Disaster Risk Management, Natural Resource Management, Food Security and Livelihoods, and Environmental and Social Impact Assessment (ESIA) and Geographical Information System (GIS). He is an alumnus of Nairobi Summer School Cohort 3, COP28 Youth Delegate. Mohamed holds a Master's Degree in Climate Change and Environmental Sustainability from Amoud University with a Scholarship for UNDP with GEF and a Bachelor's Degree in Environmental Science from the University of Hargeisa. .He founder Centre for Climate Change and Restoration (CCCLR) and Co-Founder of Geed Beer Rejo Beer Organization. Currently, He deserves a NAP Focal Point in Somaliland at UNDP with the Ministry of Environment and Climate Change.

Abstract: The health of our planet is facing an unprecedented challenge due to the environmental problems we are currently facing. Climate change, air and water pollution, deforestation, and plastic pollution are just a few examples of these challenges. These problems are having significant impacts on our environment, wildlife, and human health. (Duchaeva and Magomadov 2023). Somalia emerged from six failed rainfall seasons since 2020, killing millions of livestock, decimating crops, displacing millions and leading to food insecurity for more than 8 million people, to Elnino floods from November 2023 that have impacted many regions leading to the deaths of more than 100 people an d displacement of over 700,000 across the country. The 2016-2017 drought alone was estimated to have caused over USD 3.25 billion in economic losses, alongside significant non-economic damages, including displacement, cultural erosion, and loss of human lives. Somalia's agriculture- centric economy, faces further threats from unpredictable weather patterns, leading to food insecurity and livelihood losses.

There is significant and measurable risk from climate change resulting in crop failures, food and water insecurity, livestock deaths, destruction of homes and infrastructure, loss of livelihoods and displacement (Fanda 2019).

Mogadishu hosts the largest estimated protracted internally displaced population in Somalia, mainly living in informal IDP sites across the city. Moreover, people continue to move into the city from other parts of the country, while others are forced to move from within the city to its outskirts. In conclusion, the case study conducted in Mogadishu, Somalia underscores the crucial role of media in environmental and climate action, as illustrated by the diverse distribution of participants and their insights. Among the 400 respondents, the majority were from the general public (46.5%), with significant contributions from media practitioners (25%), government officials (13.5%), and experts (7.5% each from environmental/climate change and community/civil society representatives). This diversity provides a comprehensive understanding of media's impact on public awareness and policy-making. A notable shift towards digital media as the primary source of information (75% of respondents) highlights the importance of leveraging online platforms for climate communication. While 77% of participants find climate information relevant and 84.75% find it comprehensible, challenges such as low public awareness (27.75%), resource constraints (21.5%), and information access (19.5%) hinder effective media reporting. Nonetheless, the strong support (80%) for prioritizing environmental and climate issues indicates a clear mandate for media organizations to focus on these areas, thereby enhancing public discourse and promoting informed action. Nowadays the environmental degradation has become one of the major issues of concern. Media coverage of environmental issues is the most important issue that each of mass society can attend while drawing attention to the environment. With all this back ground this research is to assess the role of media in driving environmental and climate action in Mogadishu- Somalia.

Key Words: *Environmental Problems, Climate Change, Media, Awareness*

1. Introduction:

Our Earth is fading away. Our environment is destroying. Undoubtedly, we are facing with seriously consequences of environmental crisis caused by ourselves. The world is harmed by the uniformed and irresponsible acts of community (Thi and Chi 2009). Major environmental issues are through Forest and Agricultural land degradation, Resource depletion (water, mineral, forest, sand, rocks etc.,), Environmental degradation, Public Health, Loss of Bio diversity ,Loss of resilience in ecosystems, Livelihood Security for the Poor. (Dr. Onkargouda Kakade 2013). The health of our planet is facing an unprecedented challenge due to the environmental problems we are currently facing. Climate change, air and water pollution, deforestation, and plastic pollution are just a few examples of these challenges.
These problems are having significant impacts on our environment, wildlife, and human health. (Duchaeva and Magomadov 2023).

Climate is the average weather over a long time period (30 – 50 years) in a region. Climate change is "a systematic change in the long-term state of the atmosphere over multiple decades or longer. (Anon 2016). It may be a change in average weather conditions or the distribution of events around that average (e.g., more or fewer extreme weather events). Climate change may be limited to a specific region or may occur across the whole Earth (Dr. Onkargouda Kakade 2013). Climate change as we know it now typically focuses on

environmental changes brought about by human involvement in the ecosystems.
Changing climate has emerged as one of the most severe environmental issues that humanity has ever faced. Even though the matter has existed for generations, it was not until the 1980s that it was brought to the public's notice. Ever since, environmentalists have voiced grave worry about the implications of

human interference in climate change, claiming that they represent grave dangers to geographical, social, & economic institutions (Ahmed 2022).

1.1 Background of the study

1.1.1 Environmental and Climate Change Impacts:

The world is facing a triple planetary crisis of climate change, nature (biodiversity) loss, and pollution and waste, with the most egregious consequences felt by those least responsible. These crises are also intertwined: nature-based solutions are promoted as climate change solutions even as heat domes fuel forest fires; extraction of minerals for green energy solutions negatively impacts biodiversity and creates pollution and waste; and carbon major companies are also among the largest producers of plastic pollution (Sara L Seck 2022).

In 2016, a United Nations Environment Programme (UNEP) Frontiers report identified a series of global and emerging environmental problems that bring new challenges for the national and international environmental agencies and sustainable development organizations. In the last 50 years scientific research detailed monitoring and statistical records on a global scale prioritized environmental problems for their significance and the need for urgent action. Emerging environmental problems in the last decades have been accumulated to the old ones, bringing new challenges to international and national environmental protection institutions. The history of the emerging environmental problems facing advanced societies in the period 1950s-1970s is very revealing. At the same time there are new economic, social and technological changes on a global scale due to globalization (-Valavanidis and Valavanidis 2019).

Within Africa, Climate change has been identified as a leading human and environmental crisis of the 21st century. The problem of understanding climate change (or global warming) is one of the major challenges confronting African people, their governments and the African Union (AU). Moreover, it has been argued that climate change leads to acute conflicts and it therefore becomes imperative to achieve a proper understanding of the phenomenon in Africa. Great public, political and academic attention is now being devoted to the issue of global warming and climate change. A broad scientific and political consensus has been established that climate change poses a considerable threat to Africa, its ecosystems and many of its species: The science has become more irrevocable than ever: climate change is happening. The evidence is all around us. And unless we act, we will see catastrophic consequences including rising sea-levels, droughts and famine, and the loss of up to a third of the world's plant and animal species (Tadesse 2010).

Somalia, in particular stands out as one of the most vulnerable countries to the impacts of climate change and the resulting loss and damages. The University of Notre Dame's Global Adaptation Initiative (ND-GAIN) Country Ranking on vulnerability designates it as one of the world's most vulnerable countries to climate change. Somalia has experienced countless conflicts, episodes of violence, and natural disasters since the collapse of the Somali state in 1991. This has led to large recurring waves of forced displacement both within Somalia and to neighboring countries and beyond. The drought experienced in large swathes of Somalia in 2022-2023 was estimated to be the worst in over four decades. This historic drought that brought the country to the brink of famine was followed by a heavy rainy (deyr) season six months after. This series of natural disasters have led to the displacement of hundreds of thousands of IDPs and caused the loss and devastation of livelihoods, and further increasing families'

vulnerabilities. The ever growing displacement crisis in Somalia has contributed to rapid urbanization, characterized by significant rural-urban displacement (Map 2024).

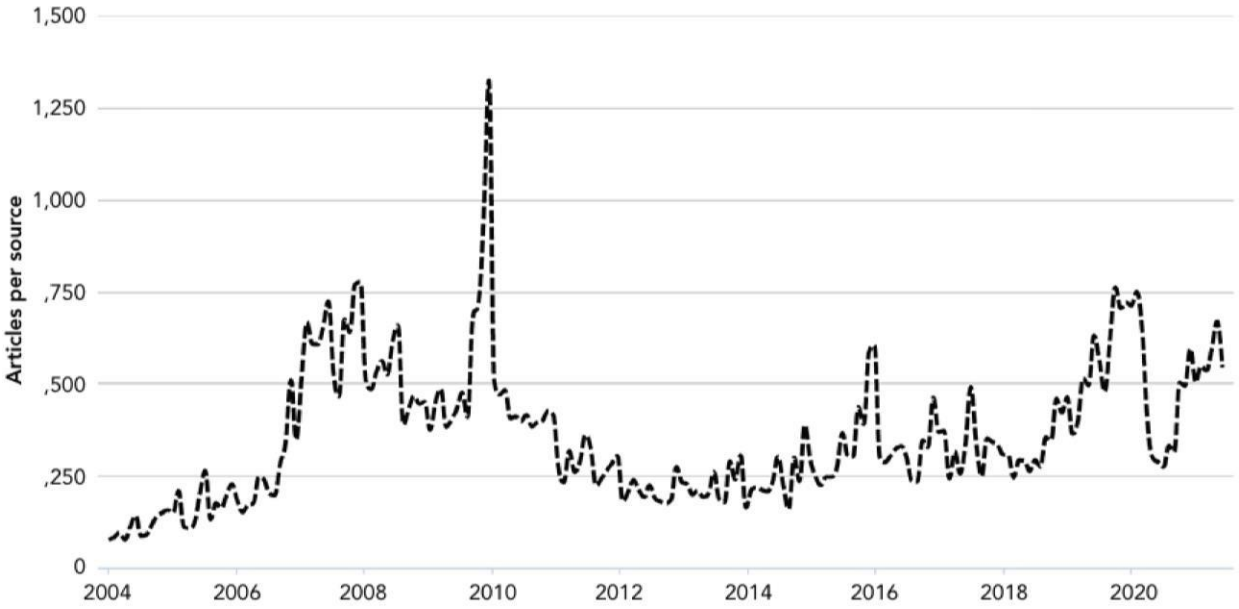
Somalia emerged from six failed rainfall seasons since 2020, killing millions of livestock, decimating crops, displacing millions and leading to food insecurity for more than 8 million people, to Elnino floods from November 2023 that have impacted many regions leading to the deaths of more than 100 people an d displacement of over 700,000 across the country. The 2016-2017 drought alone was estimated to have caused over USD 3.25 billion in economic losses, alongside significant non-economic damages, including displacement, cultural erosion, and loss of human lives. Somalia's agriculture- centric economy, faces further threats from unpredictable weather patterns, leading to food insecurity and livelihood losses.
There is significant and measurable risk from climate change resulting in crop failures, food and water insecurity, livestock deaths, destruction of homes and infrastructure, loss of livelihoods and displacement. Somalia's vulnerability is further exacerbated by its national circumstances, including challenges associated with human security and stability, environmental and economic capacities (Fanda 2019).

1.1.2 Media Mobilization for Environmental and Climate Action:

Nowadays the environmental degradation has become one of the major issues of concern. Media coverage of environmental issues is the most important issue that each of mass society can attend while drawing attention to the environment. Boom of the 60s decade was the beginning of a serious attention towards the environment in the media. Regarding paying attention to the environment, there is a significant increase in recent decades especially in some legislation which make it possible to pay more attention to environmental issues by the media in Iran. Media can shape people's behavior and attitudes towards environment (Abdi 2015).

Because of the severe effect of climate change it is the need of hour to study the reasons, causes and impacts of climate change and it is very urgent to create awareness about causes and impacts of climate change. In these days media has become the important part of life. However, we know that, mass media is to inform and educate the people. Awareness is the key role to reduce these impacts of climate change.
Media can play a vital role in creating awareness about climate change. Much research has not been conducted into the representation of climate change in the media. Specifically, the communication of climate change from scientists and policy- makers to the public via the mass media has been a subject of major interest because of its implications for creating national variation in public understanding of a global environmental issue. Media knows the significance of covering environmental issues. All media like T V, Radio, Newspaper and new media spread the news and information at the speed of light.
Language press, regional papers, small papers they all give at least minimum importance to climate change coverage (Dr. Onkargouda Kakade 2013).

Figure 1 World newspaper coverage of climate change and global warming, 2004–2020



Comments: Number of stories in newspaper coverage of climate change or global warming in 112 sources across 56 countries in seven different regions around the world.

Source: (Kunelius and Roosvall 2021).

1.3 Scope and Significance of the study:

One of the natural events that has an impact on human life is Environmental and Climate crisis. Globalization is to blame for the frequent changes in climate that we experience. Understanding the effects of climate change can help us live healthier lives. The purpose of the media is to inform the public and raise awareness of climate change and its effects. The media—radio, television, newspapers, and the internet—all contribute to raising public awareness of Environmental and climate crisis. This study will be useful in evaluating the media's ability to effectively raise public awareness of environmental and climate change.

1.4 Research problem

Somalia is highly vulnerable to the impacts of climate change, resulting in significant loss and damages. Mogadishu, in particular, experiences extreme climate conditions and faces environmental consequences, along with health risks such as increased diseases. Climate change exacerbates the existing health problem of malaria, with higher temperatures and increased rainfall attracting disease vectors.

Additionally, floods and droughts associated with climate change lead to population displacement, affecting rural communities migrating to urban cities for better livelihoods as a result, there is a need to examine the specific contribution of media in raising awareness, influencing public attitudes, shaping policy-making, and fostering environmental and climate action in the context of Mogadishu. Therefore, this study aims to analyze the role of media in driving environmental and climate action in Mogadishu, Somalia, with the ultimate goal of identifying strategies to enhance media's impact on environmental awareness and sustainable

practices in Somali.

1.5 Objectives of the Study:

- To assessing the role of media platforms, including traditional media outlets and digital platforms, in raising environmental awareness.
- To identifying Challenges facing the media in reporting on climate change and environmental issues.
- To developing Strategies for Effective Media Engagement and Content Development.

2. Review of literature

The present investigation was designed to study the role of Media in driving for environmental and climate action. It was also intended to know what the rate do the people have credibility on Media to assess climate change. Keeping the above aspects in view, the relevant literature has been reviewed and presented below:

Bern, Berlin, Bruxelles, Frankfurt and Main, Oxford, Wien, (2009), Climate Change and the Media brings together an international group of scholars to discuss one of the most important issues in human history: climate change. Since public understanding of the issue relies heavily on media coverage, the media plays a pivotal role in the way we address it. This edited collection - the first scholarly work to examine the relationship between climate change and the media - examines the changing nature of media coverage around the world, from the USA, the UK, and Europe, to China, Australasia, and the developing world.

Nimish Kapoor, (2011), the present study was to assess the role different information channel amongthe people of Shringverpur village, Allahbad District. It is found that, approximately 40% of the people preferred television programmes whereas 26% of the rural people showed their interest in radio programmes. Hence, information channels can play a important role to bridge the gap between science and society.

Apolinary Tairo,(2011), studied to know the role of print media in creating awareness about climate change in Tanzania, Africa. It is learnt from the study that Print media, which is still dominant and most influential compared to electronic media (internet, radio, television, blogs, etc.) in Africa, has so far played a leading role in educating and informing the public on effects of environmental deterioration and related human impacts. But little has been done on climate change.(Dr. Onkargouda Kakade 2013).

Yuki Sampei , Midori Aoyagi-Usui (2009) examined analysed Japanese newspaper coverage of global warming from January 1998 to July 2007 and how public opinion during parts of that period were influenced by newspaper coverage.It show a dramatic increase in newspaper coverage of global warming from January 2007 correlated with an increase in public concern for the issue. Before January 2007, it has found that coverage of global warming had an immediate but short-term influence on public concern.
With such transitory high levels of media coverage we suggest that for more effective communication of climate change, strategies aimed at maintaining mass-media coverage of global warming are required (Suresh 2018).

Dirk von Schneidemesser, 2011, this was ten years 2000-2010 research of increasing frequency of articles relating to climate change in Indian newspapers. Results show that in 2009

there 484 articles were published, it was almost the double of articles published in 2008. In 2007 194 articles its almost double than the before years. By this study it can be concluded that frequency of coverage is been increasing by every year.

Amoli Martha Rodrigues, 2008, it was to analyse the study of readers of two daily newspapers inMangalore city about global warming. Interesting fact is that people of Mangalore know about global warming through the medium of newspapers only. Mangalore people like to read the newspaper Deccan Herald for environmental issue. They find this newspaper is easy to understand environmental issues compared to The Hindu, another leading newspaper in India. Readers even opined that photographic coverage is good and they consider environmental news very effective. (Dr. Onkargouda Kakade 2013).

3. Methodology:

3.1 Research design

Our study employs a descriptive research design. The random sample approach was used as the research strategy in this study. Its main goals are to assess the role of media in driving environmental and climate action in Mogadishu- Somalia. The approach of random sampling is applied in this assess and Using Slovin's formula, with a 5% margin of error, we determined a sample size of 400 participants among the Mogadishu-Somalia. The questionnaire technique was used for the assess. A questionnaire is a group of questions created in a systematic and structured way to collect data from respondents regarding a specific issue. An online survey questionnaire was developed to gather data on Environmental and climate change awareness and perceptions. The primary data collection instrument for this study was an online survey questionnaire administered via Google Forms. This questionnaire was designed to gather comprehensive and relevant data from the population of Mogadishu, which, according to Macro trend, has a current metro area population of 2,727,000 in 2024. The study focused on Mogadishu, the largest city and capital of Somalia, targeting a sample size of 400 participants to ensure a representative dataset. For data analysis, SPSS was employed to process and analyze the collected responses, enabling the extraction of meaningful insights and statistical significance from the survey data. Statistical methods such as percentages, averages, ratios and weighted averages are used to assess the primary data obtained from the sample population through interview schedules in order to create projections, derive significant findings, and more.

3. 4 Study area

Mogadishu, also known as Xamar, is the largest city in Somalia and the capital of the country. The city of Mogadishu consists of 17 administrative districts and 5 villages under the control of the local government of the Benadir region (SARAH, 2020). Mogadishu has a dry climate, being a city near the equator. It is classified as warm and semi-arid (Koeppen climate classification BSh). The city is located in a large part of the desert area. The city receives only 427 millimeters of precipitation per year, most of which falls during the rainy season. The amount of rainfall varies considerably from year to year, and Somalis suffer from drought all the time (SAĞIR and SAHAL 2022).

According to Macro trend the current metro area population of Mogadishu in 2024 is 2,727,000. The population of Mogadishu is growing very rapidly. In addition, Mogadishu has been experiencing an increasing real estate boom for almost the last decade, fueled by Somalis returning from abroad and remittances (which have significantly outpaced foreign direct investment). These factors trigger enormous levels of forced displacement within the city, especially internally displaced persons (SAĞIR and SAHAL 2022).

Mogadishu hosts the largest estimated protracted internally displaced population in Somalia, mainly living in informal IDP sites across the city. Moreover, people continue to move into the city from other parts of the country, while others are forced to move from within the city to its outskirts. DTM's October 2017 data collection focusing on the greater Mogadishu area (covering Daynile, Dharkenley, Wadajir,

Hodan, Kahda, Xamar Jabjab, Waaberi identified a total of 545,000 individuals in over 840 IDP sites (the UN migration agency 2017).

3.4.1 Map of Mogadishu

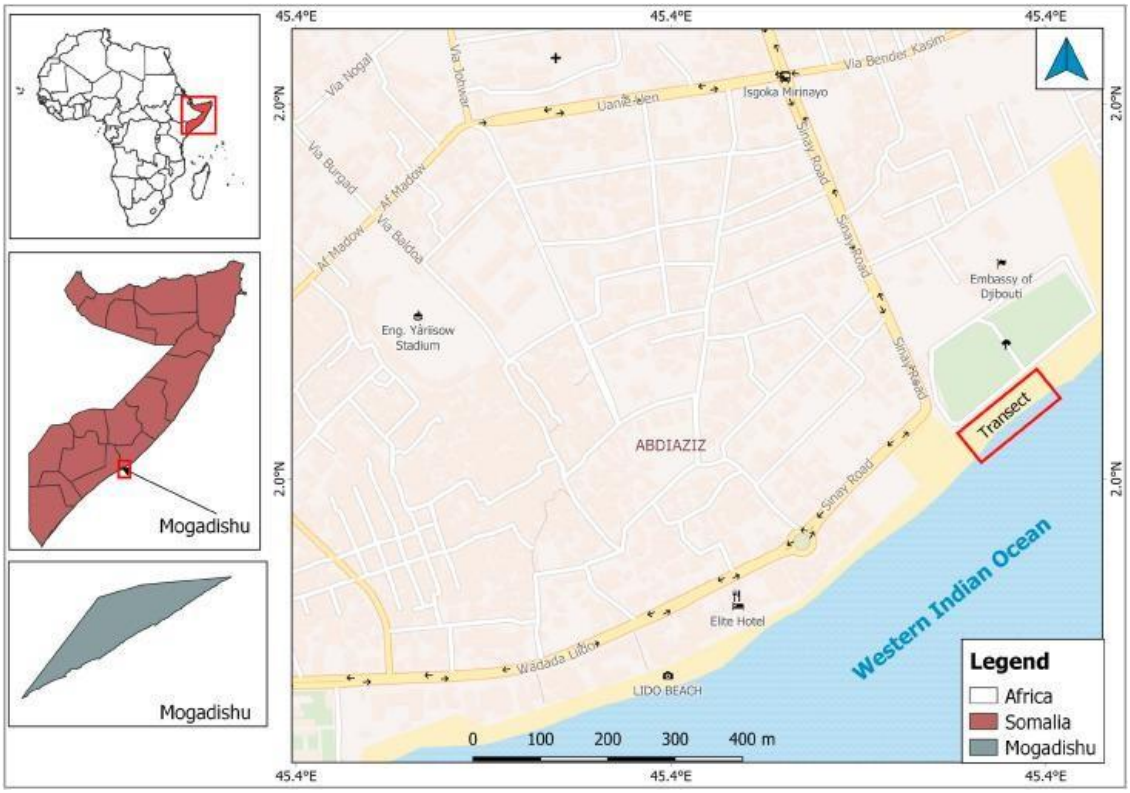


Figure 2. Map of Mogadishu (Hassan et al. 2024).

3.5. Sample size

In conducting this study to assess the role of media in driving environmental and climate action in Mogadishu- Somalia. We used the Slovenes' formula to determine the appropriate sample size.

Mogadishu, the capital city of Somalia, has an estimated population of 2,727,000. Accurate and representative sampling is crucial for the validity of our study, and Slovenes' formula provides a systematic approach to achieve this.

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

Where:

n is the sample size.

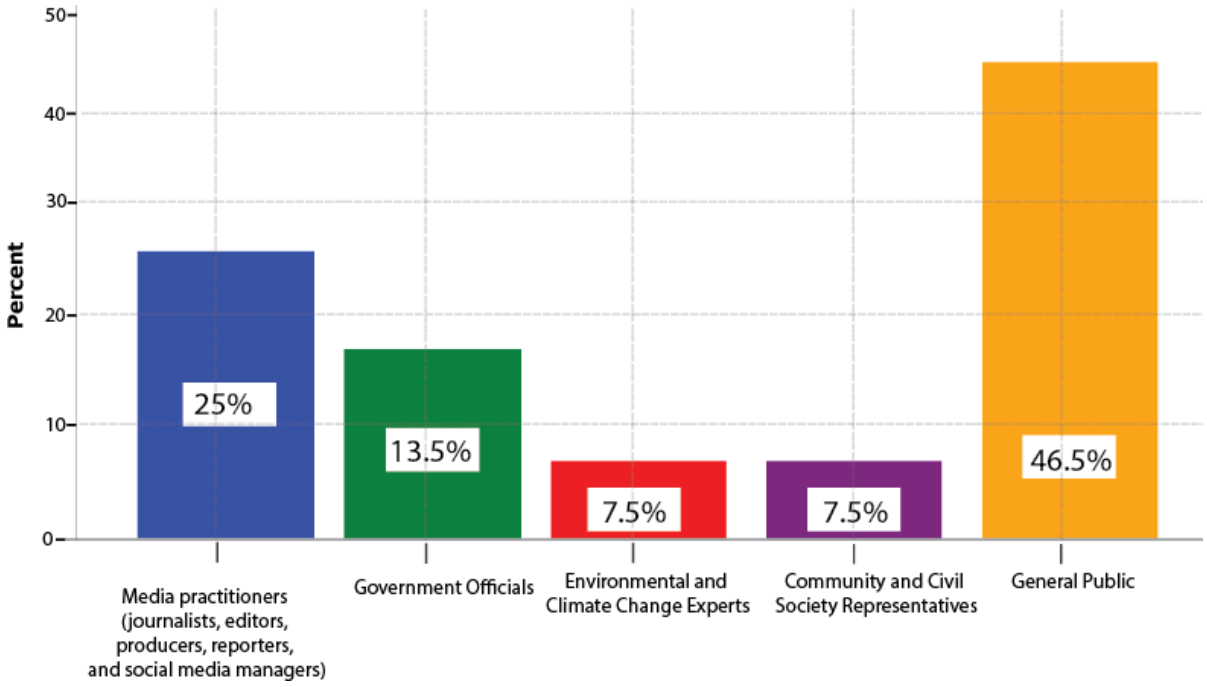
N is the population size (2,727,000)

e is the margin of error 5% (0.05)

$$n = \frac{2{,}727{,}000}{1+2{,}727{,}000(0.052^2)} = \frac{2{,}727{,}000}{2{,}727{,}001\times 0.0025} = \frac{2{,}727{,}000}{1+6{,}817.5} = \frac{2{,}727{,}000}{6{,}818.5} = \mathbf{400}$$

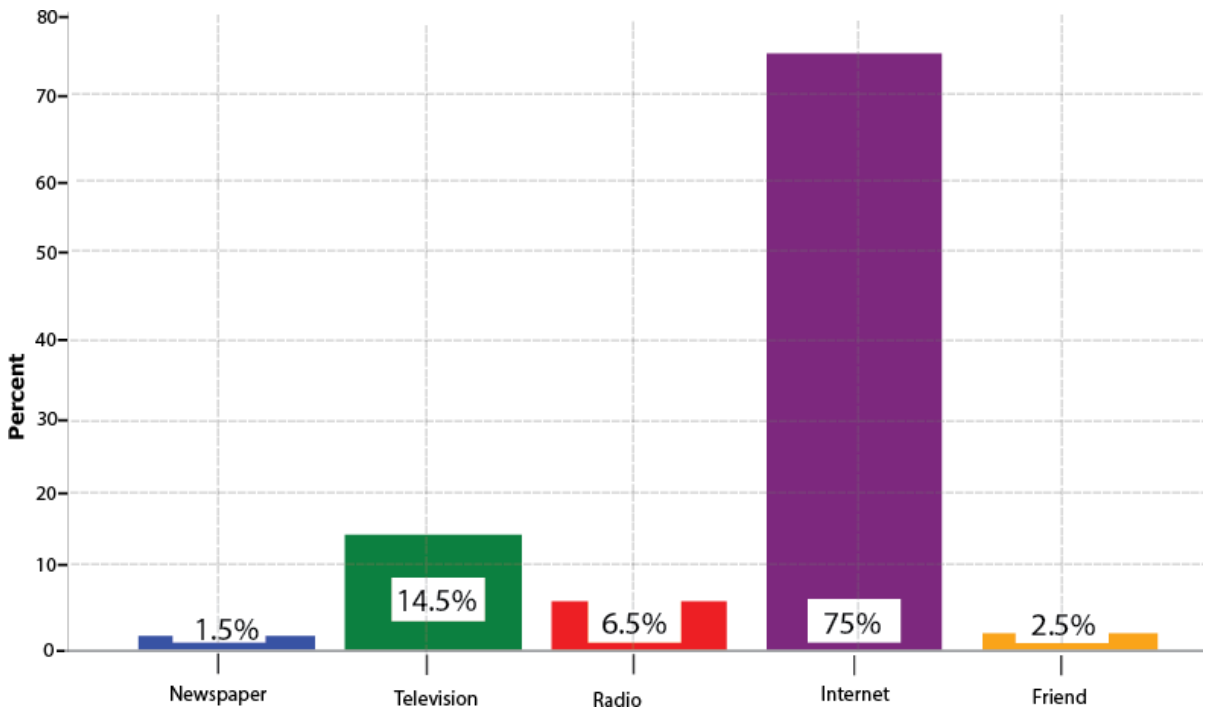
4. Finding

4.1 Kind of respondents



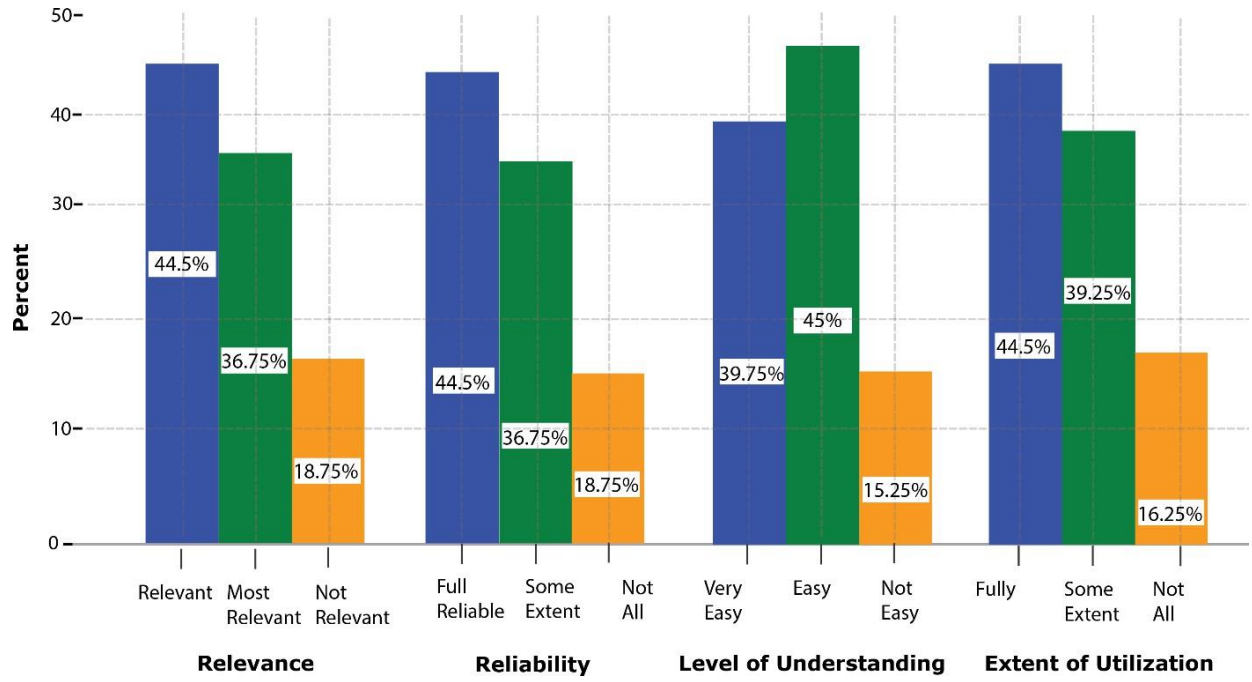
The table 4.1 above shows the distribution of participants in different categories of respondents. Out of the 400 total respondents: These individuals, including Media Practitioners (100 participants, 25%), Government Officials (54 participants, 13.5%), Environmental and Climate Change Experts (30 participants, 7.5%), Community and Civil Society Representatives (30 participants, 7.5%), and the General Public (186 participants, 46.5%), The largest group is the General Public (46.5%), while the smallest groups are Environmental and Climate Change Experts and Community and Civil Society Representatives (both 7.5%) provide valuable insights into the strategies, challenges, and impact of media in driving environmental and climate action. The perspectives of the general public offer valuable insights into public awareness, attitudes, and behaviors towards environmental and climate action, as well as the influence of media in shaping opinions and promoting action.

4.2 Source of Environmental issues and climate change Information



The Table 4.2 above shows the distribution of participants' preferred sources of environmental issues and climate change information. Out of the total respondents: Newspaper: 6 participants (1.5%), Television: 58 participants (14.5%), Radio: 26 participants (6.5%), Internet: 300 participants (75%)
And Friends: 10 participants (2.5%), These preferences highlight the dominant role of the Internet (75%) as the primary source of information, with traditional media like newspapers (1.5%) and radio (6.5%) being the least preferred.

4.3 Analysis of media content regarding the climate change and environmental issues.



The Table 4.3 above shows the analysis of media content regarding climate change and environmental issues based on four aspects: relevance, reliability, level of understanding, and extent of utilization, reveals a mixed but generally positive reception among the 400 respondents. Relevance: Relevant: 182 participants (45.5%),

Most Relevant: 126 participants (31.5%) and Not Relevant: 92 participants (23%). This data indicates that a significant majority (77%) of the participants find media content on climate change and environmental issues to be relevant or most relevant.

Reliability: Fully Reliable: 178 participants (44.5%), To Some Extent: 147 participants (36.75%)

And Not at All: 75 participants (18.75%). Nearly half of the respondents (44.5%) consider the information fully reliable, while a substantial portion (36.75%) finds it reliable to some extent.

Level of Understanding: Very Easy: 159 participants (39.75%), Easy: 180 participants (45%)

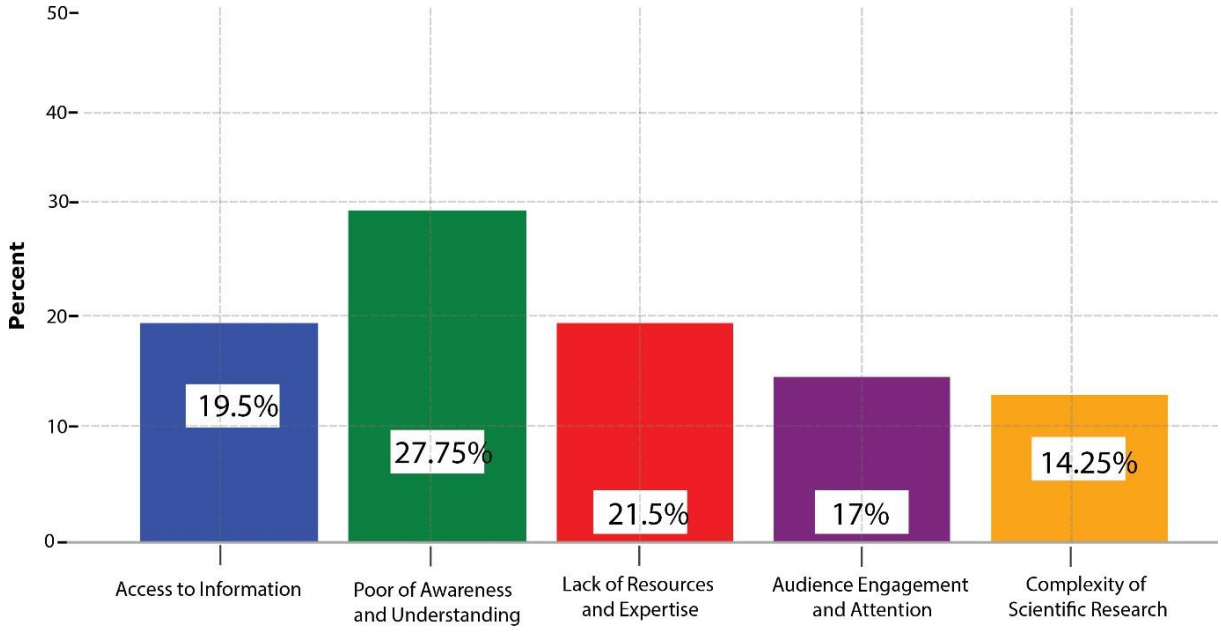
And Not Easy: 61 participants (15.25%). A majority (84.75%) of participants find the content easy or very easy to understand, indicating good accessibility.

Extent of Utilization: Fully: 178 participants (44.5%), To Some Extent: 157 participants (39.25%)

And Not at All: 65 participants (16.25%). Most participants (83.75%) utilize the information fully or to some extent, demonstrating the practical application of the media content provided.

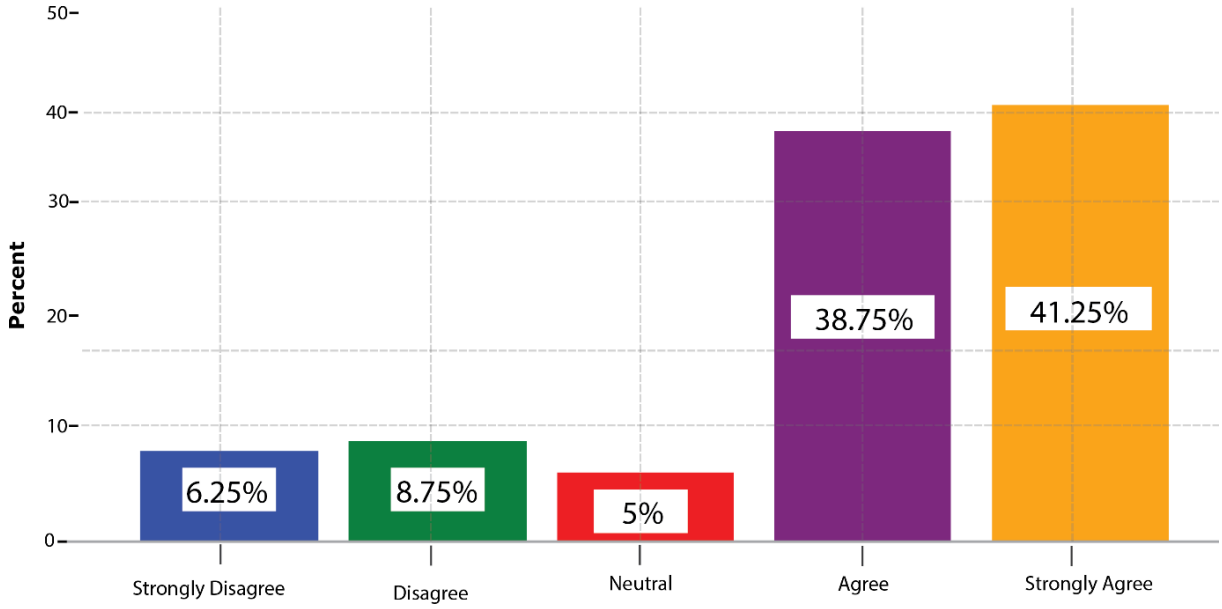
The analysis reveals that media content on climate change and environmental issues is largely perceived as relevant, reliable, and accessible, with a significant majority of participants finding it practical and easy to utilize. This underscores the critical role of media in disseminating valuable information on these crucial topics.

4.4 The Challenges facing the media in reporting on climate change and environmental issues



The chart 4.4 above shows the Challenges facing the media in reporting on climate change and environmental issues. Poor Awareness and Understanding: 111 participants (27.75%): This challenge appears to be the most significant based on the scores provided. It indicates that a substantial barrier for media reporting is the lack of public understanding and awareness of climate change and environmental issues. Lack of Resources and Expertise: 86 participants (21.5%): This challenge underscores the importance of sufficient resources and expertise within media organizations to effectively report on complex scientific and environmental topics. Access to Information: 78 participants (19.5%): This challenge highlights the difficulty in obtaining accurate and timely information necessary for comprehensive reporting on climate change and environmental issues. Audience Engagement and Attention: 68 participants (17%): Media face challenges in capturing and maintaining audience interest in climate change and environmental stories, despite their importance. Complexity of Scientific Research: 57 participants (14.25%): The complexity of scientific research poses a challenge in translating and communicating findings accurately and understandably to the general public.

4.5. Media organizations have a responsibility to prioritize environmental and climate-related issues in their content development and engagement strategies



The graph shows 4.5 above the responses to the statement regarding the responsibility of media organizations to prioritize environmental and climate-related issues in their content development and engagement strategies, that Disagreement (Strongly Disagree + Disagree): Together, 60 participants (15%) either strongly disagree or disagree that media organizations should prioritize environmental and climate-related issues. This indicates a minority opinion against prioritizing these issues in media content. Neutral: 20 participants (5%) are neutral on whether media should prioritize these issues, suggesting a lack of strong opinion or uncertainty among some respondents.

Agreement (Agree + strongly agree): A significant majority of 320 participants (80%) agree or strongly agree that media organizations should prioritize environmental and climate-related issues. This demonstrates strong support for media engagement in addressing these critical topics.

5. Results and Discussion

The Table 4.1 Participant Distribution reveals the presence of diverse groups, Total Respondents: 400 individuals. Including media practitioners (journalists, editors, producers, reporters, and social media managers) 100 participants (25%), Government Officials: 54 participants (13.5%). Environmental and Climate Change Experts: 30 participants (7.5%). Community and Civil Society Representatives: 30 participants (7.5%). And General Public: 186 participants (46.5%). This diversity ensures a comprehensive understanding of the strategies, challenges, and impact of media in driving environmental and climate action. Key Insight: The largest group is the General Public (46.5%), while the smallest groups are Environmental and Climate Change Experts and Community and Civil Society Representatives (both 7.5%). These groups provide valuable insights into the strategies, challenges, and impact of media in driving environmental and climate action.

The Table 4.2 shows that Preferred Sources of Environmental and Climate Change Information

Sources: Newspaper: 6 participants (1.5%), Television: 58 participants (14.5%), Radio: 26 participants (6.5%),

Internet: 300 participants (75%), and Friends: 10 participants (2.5%). Key Insight: The Internet (75%) is the dominant source of information, while traditional media like newspapers (1.5%) and radio (6.5%) are the least preferred. This highlights the shift towards digital media for environmental and climate change information.

Table 4.3 indicates Analysis of Media Content regarding the climate change and environmental issues. Relevance: Relevant: 182 participants (45.5%), Most Relevant: 126 participants (31.5%), and Not Relevant: 92 participants (23%). Key Insight: A significant majority (77%) find media content on climate change and environmental issues to be relevant or most relevant. Reliability: Fully Reliable: 178 participants (44.5%), To Some Extent: 147 participants (36.75%) Not at All: 75 participants (18.75%), Key Insight: Nearly half (44.5%) consider the information fully reliable, while a substantial portion (36.75%) finds it reliable to some extent. Level of Understanding: Very Easy: 159 participants (39.75%), Easy: 180 participants (45%), And Not Easy: 61 participants (15.25%). Key Insight: A majority (84.75%) find the content easy or very easy to understand, indicating good accessibility. Extent of Utilization: Fully: 178 participants (44.5%), To Some Extent: 157 participants (39.25%), And Not at All: 65 participants (16.25%). Key Insight: Most participants (83.75%) utilize the information fully or to some extent, demonstrating practical application of the media content. Overall Insight: Media content on climate change and environmental issues is largely perceived as relevant, reliable, and accessible, with a significant majority finding it practical and easy to utilize. This underscores the critical role of media in disseminating valuable information on these crucial topics.

The Table 4.4 provides insights into the challenges faced by the media in reporting on climate change and environmental issues. Poor Awareness and Understanding: 111 participants (27.75%), Lack of Resources and Expertise: 86 participants (21.5%), Access to Information: 78 participants (19.5%), Audience Engagement and Attention: 68 participants (17%) and Complexity of Scientific Research: 57 participants (14.25%) Key Insight: The most significant challenge is poor awareness and understanding (27.75%), indicating a substantial barrier for media reporting. Other notable challenges include lack of resources and expertise (21.5%), access to information (19.5%), audience engagement (17%), and the complexity of scientific research (14.25%).

The Table 4.5 presents responses regarding the responsibility of media organizations to prioritize environmental and climate-related issues, the Disagreement (Strongly Disagree + Disagree): 60 participants (15%)

Neutral: 20 participants (5%), and Agreement (Agree + strongly agree): 320 participants (80%). Key Insight: A significant majority (80%) agree or strongly agree that media organizations should prioritize environmental and climate-related issues, demonstrating strong support for media engagement in addressing these critical topics. Only a minority (15%) disagrees, and a small portion (5%) remains neutral.

6. Recommendations

- **Provide comprehensive training to journalists:** Offer training programs to journalists that focus on environmental science and climate change. These programs will enhance their reporting skills and equip them with the knowledge and expertise to effectively cover environmental issues

- **Encourage local reporting:** Encourage media organizations to deploy their own reporters to cover local environmental issues. By having reporters on the ground, media outlets can provide in-depth and context- specific coverage of environmental challenges faced by the local community.

- **Foster journalistic competition:** Organize competitions among journalists to encourage reporting on environmental issues and climate change. This initiative will help identify highly skilled journalists who can effectively communicate complex environmental topics to the public. Recognizing and rewarding exceptional reporting will motivate journalists to excel in their coverage and drive media attention towards these critical issues.

- **Foster collaboration between media and relevant agencies:** Promote collaboration and cooperation between media organizations and government agencies, ministries, and other entities working on environmental issues and climate change. By establishing partnerships, journalists can access reliable information, expert insights, and exclusive stories. This collaboration will enhance the accuracy and depth of media reporting while providing a platform for policymakers to communicate their initiatives to the public.

- **Integrate environmental issues into daily programming:** Encourage media outlets across the country to prioritize environmental issues and climate change by making them a regular part of their daily programs. This ensures consistent coverage and raises public awareness about the urgency and importance of these topics. Media organizations can dedicate specific time slots or segments to discuss environmental issues, conduct interviews with experts, and provide updates on ongoing initiatives.

- **Promote community participation:** Emphasize the importance of community involvement in raising public awareness about environmental issues and climate change. Encourage community members to actively participate in media initiatives by sharing their experiences, concerns, and solutions. By amplifying diverse voices and perspectives, media can foster a sense of collective responsibility and inspire action within the community.

- **Harness the power of online media:** Recognize the significance of online media platforms, considering the widespread internet access among the Somali community. Encourage media organizations to prioritize online platforms such as websites, social media, and online streaming services. By leveraging the reach and interactivity of online media, media organizations can effectively engage with a broader audience and disseminate timely and relevant information on environmental issues and climate change.

6. Conclusion

In conclusion, the case study conducted in Mogadishu, Somalia highlights the diverse participant distribution, preferred sources of information, analysis of media content, challenges faced by the media, and the responsibility of media organizations in driving environmental and climate action. The presence of diverse groups, including media practitioners, government officials, experts, community representatives, and the general public. The distribution of participants in this study (Total Respondents: 400) provides a comprehensive perspective on the role of media in environmental and climate action, with diverse groups including Media Practitioners (25%), Government Officials (13.5%), Environmental and Climate Change Experts (7.5%), Community and Civil Society Representatives (7.5%), and the General Public (46.5%). The dominance of the General Public (46.5%) ensures that public opinions and behaviors are well-represented, while input from specialized groups like Environmental and Climate Change Experts (7.5%) and Community and Civil Society Representatives (7.5%) adds depth to the understanding of the strategic challenges faced by media in this domain. This diversity highlights the multifaceted nature of media influence on public awareness and policy-making in environmental and climate issues.

The preferences for sources of environmental and climate change information reveal a significant shift towards digital media, with the Internet being the primary source for 75% of respondents, compared to traditional media such as newspapers (1.5%) and radio (6.5%). This trend underscores the importance of leveraging digital platforms for disseminating climate-related information. Moreover, the analysis of media content shows that a significant majority (77%) find climate change information relevant or most relevant, and 84.75% find it easy or very easy to understand. Despite these positive perceptions, media reporting faces notable challenges such as poor public awareness (27.75%), lack of resources (21.5%), and access to information (19.5%). However, the strong support (80%) for media prioritization of environmental and climate-related issues demonstrates a clear mandate for media organizations to enhance their focus on these critical topics, thereby playing a pivotal role in driving informed public discourse and action.

In conclusion, media plays a pivotal role in driving climate change awareness in Somalia by disseminating critical information, influencing public opinion, and mobilizing community action. Through various platforms, media can bridge the knowledge gap and foster a collective response to environmental challenges. Continued investment in media infrastructure and training is essential to enhance its impact. Ultimately, an informed public, galvanized by effective media, can champion sustainable practices and policies for a resilient future.

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Young Onset, Devastating Impact: investigating Intracerebral Hemorrhage burden in Young Adults in Mogadishu, Somalia

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Abstract

Introduction: Spontaneous Intracerebral hemorrhage (ICH) in young patients is less common and not well studied compared to ICH in older patients. The etiology, risk factors and outcome of ICH in young patients may have regional and ethnic differences. The study aims to investigate the clinical characteristics, risk factors, etiology and outcome of spontaneous intracerebral hemorrhage in young adults in Somalia.

Methods: The study enrolled 168 young patients with ICH (16–50 years) admitted to the neurology department of a tertiary hospital from 2019 to 2022. The information about the demographic details, documented ICH risk factors, etiology and patients' clinical status were retrieved. The etiology of ICH was determined based on clinical, laboratory and radiological findings. Intra-hospital survival status and associated factors were assessed.

Results: The mean age of the patients was 35±8.6 years. 99 (59%) of patients were male while 69 (41%) were females. Hypertension 48 (29%) was the most common risk factor, followed by substance abuse. Hypertensive hemorrhage was the most common etiology of ICH 60 (35.7%), followed by cerebral venous thrombosis (CVT) 5(15%), substance abuse 23 (13.7%) and arteriovenous malformation (AVM) in 10 (6%). AVM, CVT, cavernoma, eclampsia, substance abuse and cryptogenic etiology were more common in the 2nd and 3rd decades whereas hypertension was more common in the 4th and 5th decade. Intrahospital mortality was 28% in this study. Factors predicting intrahospital mortality were hematoma volume of greater than 30mL, thrombolytic etiology, brainstem ICH location, substance abuse related etiology, presence of associated mass effect, low GCS score on admission, high systolic blood pressure on admission, and the presence of chronic renal failure.

Conclusion: In this study, hypertension, substance abuse, CVT and vascular malformation are the leading causes of ICH in young adults. Intracerebral hemorrhage in the young has different

spectrum of etiologies and factors associated with short-term mortality compared to older patients.
Keywords: intracerebral hemorrhages, young patients, etiology, outcome, Somalia

CLIMATE CHANGE ADAPTATION STRATEGIES TO IMPROVE JOWHAR, MIDDLE SHABELLE REGION, SOMALIA'S COMMUNITY LIVELIHOOD.

Aided Hassan Ubeid

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Abstract

What is Somalia? Two of Somalia's biggest challenges are extreme weather and the consequences of climate change**.** These elements are likely to increase preexisting vulnerabilities and limit the options available to the population for a living, which could hurt Somalia's stability and security in the absence of proactive preventive measures. More frequent and severe floods and droughts have a negative impact on food security and worsen living conditions in Somalia. This has intricated and interconnected ramifications for Somalia's peace and security, including increased migration and displacement brought on by climate change, which will especially affect people whose livelihoods are affected by floods and droughts. A cross-sectional research approach was employed in this study. Both quantitative and qualitative methods were used in the investigation. General information on the issue was gathered from the many stakeholders engaged in the study, and quantitative approaches were employed for data collecting and analysis. Regarding climate change and community livelihoods, the qualitative method is employed. An interview guide was employed in conjunction with questionnaires, which served as the study's major means of data gathering. The research's conclusions demonstrate that disaster risk reduction, relocation to areas with fewer climate-related hazards, raising public awareness of climate change, and afforestation are among the climate change strategies that can be used to enhance the standard of living for local residents in Somalia's Jowhar Middle Shabelle state.

Keywords: Risk management, livelihood, Jowhar, and climate change

1. Introduction

Climate change is the phrase used to describe long-term variations in temperature and weather patterns. Significant volcanic eruptions or fluctuations in the sun's activity might be the source of these variations. However, since the 1800s, human activity has been the main contributor to climate change, mostly as a result of the burning of fossil fuels such coal, oil, and gas (Connolly-Boutin, 2019).

Given the critical role that climate plays in the construction of natural ecosystems as well as the human economies and civilizations that they are founded on, it is imperative that these phenomena be addressed. The term "climate change" refers to modifications to the climate system brought about by

notable shifts in greenhouse gas concentrations as a result of human activity. besides the long-term, naturally occurring changes in climate that have been noted.

The two main greenhouse gases that cause climate change are methane and carbon dioxide. These come from, for example, running a car on gasoline or heating a building with coal. Destroying forests and clearing land are other ways that carbon dioxide may escape the atmosphere. Oil and gas activities and agriculture are the two primary businesses that release methane. According to Dube and Phiri (2018), the main industries that produce greenhouse gases include energy, industry, transportation, buildings, agriculture, and land use.

Extreme weather and the impacts of climate change are major threats to Somalia. In the absence of proactive preventive measures, these variables are likely to worsen already-existing vulnerabilities and limit the alternatives available to the populace for subsistence, which might have detrimental effects on Somalia's stability and security. Droughts and floods that occur more frequently and intensely threaten food security and degrade livelihood conditions in Somalia. These events also negatively impact marginalized groups, inflame grievances, intensify competition for limited resources, and exacerbate already-existing tensions and vulnerabilities within communities (Tolosa & Zeleke, 2010). Somalia is the world's second-most climate-vulnerable country. The number of severe weather occurrences in the country has increased since 1990. The peace and security situation in Somalia will be affected in a complex and interconnected way by this, since migration and displacement caused by climate change are likely to grow, especially for people whose livelihoods are affected by floods and droughts.

People living together in the same environment form a community. A human community's identity and level of cohesion can be influenced by a variety of shared and present variables, including intent, beliefs, resources, preferences, needs, hazards, and numerous others ((IPCC, 2012). Securing water, food, fuel, medicine, shelter, clothes, and the ability to obtain the aforementioned necessities while working alone or in a group and utilizing resources (both human and material) to meet one's own and one's household's needs in a sustainable manner while maintaining dignity are all part of a livelihood. Ellis, 2009).

In order to sustain oneself and provide opportunities for future generations to have sustainable livelihoods, a community must possess the capabilities, assets (stores, resources, claims, and access), and activities necessary for a means of subsistence. Additionally, a livelihood must be able to recover from stressors and shocks, maintain or improve its assets, and provide net benefits to other livelihoods both locally and globally as well as in the short and long term (Nnadi, F.N.

2. Climate change tactics that can be used to raise the standard of living in the neighborhood Using Climate Change Adaptation Techniques to Boost Local Incomes*

One important worldwide issue that needs immediate attention and action is climate change. The

necessity for quick action is highlighted by the indisputable effects of climate change on ecosystems, communities, and the environment. Putting plans in place to improve community well-being is a crucial component of combating climate change. We will examine the significance of implementing climate

change solutions in this article, as well as how they may improve local livelihoods. The build-up of greenhouse gases (GHGs), such as CO2, in the atmosphere keeps causing global warming and, as a result, climate unpredictability that affects people's capacity to make a living (IPCC, 2021).

Nonetheless, it is established that rural residents create adaption strategies depending on their personal experiences in the area. For the vast majority of Nigerian families, agro-forestry is one of the best methods for mitigating the effects of climate change and adapting to them, according to Onyekuru & Marchant (2018). Not only does it provide for human necessities, but it also reduces greenhouse gas emissions and supports primary sources of income, food, and energy during crop failure. Additionally, the homes chose upgraded cookstoves, which they saw as a win-win solution for the family because it is both economical and contributes to the reduction of climate change. Furthermore, households are using wetlands more and more, taking advantage of often flooded places to plant flood-tolerant crops and vegetables, as well as employing independent cultural knowledge and practices to lessen the effects of climate change.

Adapting to changing climatic conditions to minimize risks and optimize possibilities is referred to as "climate change adaptation." It means implementing policies that increase the resilience of communities, economies, and ecosystems. By doing this, communities may better prepare for the consequences of climate change and safeguard their means of subsistence (Quinn & Paavola 2017).

It is essential to raise knowledge of climate change if emerging nations are to become sustainable. In underdeveloped nations, a major obstacle to adapting to climate change is a lack of awareness (Mendelsohn et al., 2012). In Somalia, where natural disasters are common, increasing local understanding of climate change is essential as its effects are intensifying both the frequency and severity of natural catastrophes. A person's, an organization's, or a business's level of environmental awareness reveals how they will react to adverse effects on their environment. Enhancing environmental awareness improves the planning and management of natural resources, according to several research conducted in industrialized nations (Nordhaus, 2011).

The Value of Adaptation for Employment

1. **Sustaining Agricultural Methods:** The primary source of income for many communities is agriculture. Extreme weather events that are occurring more frequently as a result of climate change include heat waves, floods, and droughts. By using drought-resistant crops, efficient irrigation techniques, and sustainable agricultural methods, communities may maintain economic stability and food security.

2. **Encouraging Sustainable Sources of Income:** Climate change regularly disrupts traditional livelihoods, particularly in places that are vulnerable. Communities may adopt sustainable practices such as eco-tourism, renewable energy initiatives, and nature-based solutions to diversify their sources of income and reduce their dependence on industries that are susceptible to climate change. This saves the earth's resources for future generations and guarantees economic sustainability.

3. Strengthening the Resilience of Infrastructure: Climate change poses a major threat to the infrastructure supporting housing, transportation, and utilities. Investing in climate-resilient

infrastructure helps protect communities from extreme weather occurrences and lessens disturbance to their way of life. Better drainage systems, flood-resistant buildings, and infrastructure for renewable energy sources are a few examples of this type of infrastructure.

4. Promoting Community-Based Adaptation: Local communities must be included in the decision-making process for adaptation to be effective. The knowledge, needs, and experiences of the community can be considered while developing climate change mitigation strategies. This participatory method ensures that adaptation techniques are tailored to communities' specific conditions and improves livelihood results by giving communities greater influence.

3. Technique and Supplement Whereabouts

The capital of Somalia's Hirshabelle state is Jowhar. In addition, Jowhar serves as the administrative center of Somalia's Middle Shabelle area. It was taken from the Islamic Courts Union and combined with Baidoa to become the joint administrative capital of the Transitional Federal Government. The city is located 90 kilometers (50 miles) to the north of Mogadishu, the country's capital, on a major route.

4. Research Design

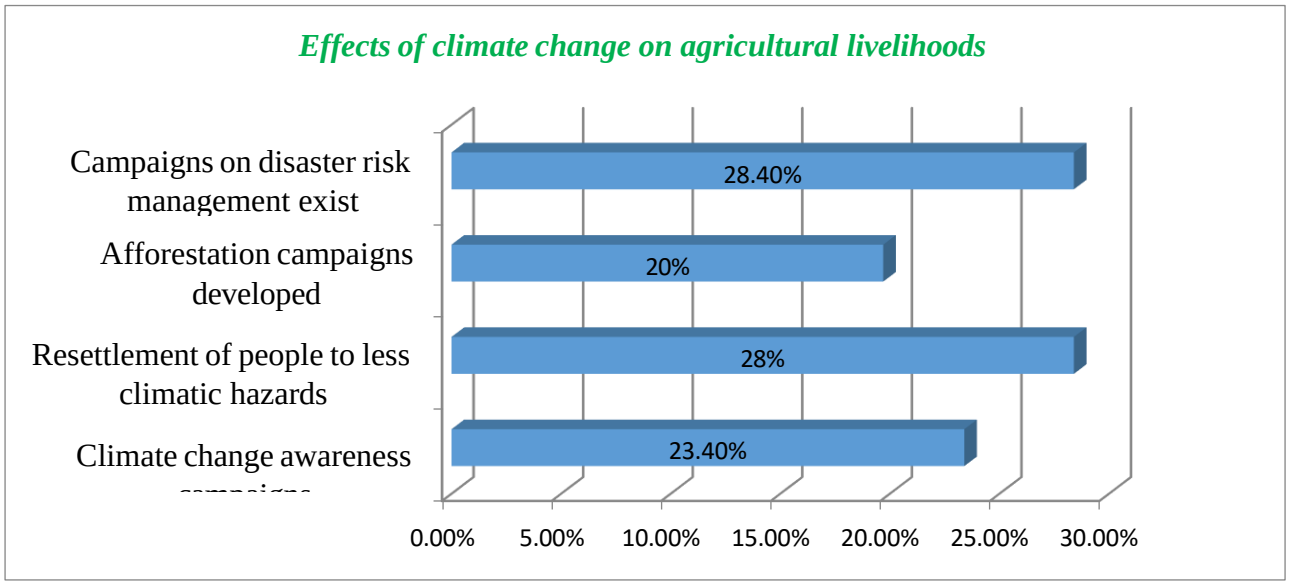
A cross-sectional research approach was employed in this study. Mixed design was also employed in the study. Of the 372 questionnaires that were provided to the respondents, 320 people provided data via surveys. Interviews with top Jowar district authorities and ten environmental officers who gave qualitative answers to the research were used to get qualitative replies.

5. Data Analysis

The statistical package for social scientists (SPSS) software program was used to evaluate the quantitative data, which included information from the surveys and provide descriptive statistics. The information from the interviews was given textural descriptors.

6. Outcomes

Strategies for addressing climate change that can be implemented to enhance community well-being Middle Shabelle area of Jowhar, Somalia



Source: Field Data, 2022

The study reveals that campaigns on disaster risk management exist, that people agree to resettlement in areas with fewer climate hazards (28.1%), that people agree to campaigns on climate change awareness (23.4%), and that people agree to campaigns on reforestation (19.7%). The above figure illustrates the results of these strategies for improving the livelihood of communities in the Jowhar middle Shabelle region of Somalia. Overall research findings indicate that climate change tactics are being used to enhance the community, which suggests that they are playing a major role in raising living standards in Somalia's middle Shabelle region.

Obstacles facing the most effective climate change mitigation solutions in the Jowhar middle Shabelle area of Somalia

Responses	Frequency	Percent
Poor implementation	67	20.9
Low institutional capacity	99	30.9
Poor Community cooperation	83	25.9
Low concerns about climate	30	9.4
Lack of community awareness	41	12.8
Total	320	100.0

Source: 2022 Field Data

The results of the study demonstrate that considerable obstacles are impeding the most effective management strategies implemented in the communities to mitigate climate change.

> *We have been unable to mitigate the issues due to environmental changes because of inefficient organizations handling the environment. Low concerns for the people, and limited effectiveness of the community in resources operationalization that hinder the range of activity that limits the prevalence of the community in climate handling mechanisms.*

District Environmental Officials, Jowhar district.08th.08.2022

7. Discussion of Results

The study reveals the following results regarding climate change strategies that can be used to improve the standard of living for communities in the middle Shabelle region of Jowhar, Somalia: campaigns on disaster risk management exist, with 28.4% of respondents agreeing; people should be resettled in areas with fewer climate hazards, with 28.4% agreeing; campaigns on climate change awareness, with 23.4% agreeing; and campaigns on reforestation, with 19.7% agreeing. Overall research results indicate that community improvement through climate strategies is prevalent, suggesting that the condition of climate change strategies used is critical to raising living standards in Somalia's middle Shabelle area.

The results of the study demonstrate that disaster risk management campaigns, population relocation to areas with fewer climate hazards, climate change awareness campaigns, and afforestation campaigns can all be used as climate change strategies to enhance the standard of living for local residents in the Jowhar middle Shabelle region of Somalia. The results are consistent with Afhenkan's (2012) findings. In order to mitigate the effects of dry spells, the communities use agricultural coping strategies such as growing a variety of enhanced cocoa, maize, and cassava hybrids as well as shorter gestation period crops that are also resistant to drought. The Sui FACs have learned the

importance of growing trees on their farms to offer shade for the crops and NTFPs via capacity building and sensitization initiatives (ibid). It has been reported that when the supply of important NTFPs, such as

herbal plants, gradually decreased, the people turned to alternative forms of revenue to complement their way of life, such as honey production, snail farming, mushroom cultivation, and rabbit keeping.

8. Wrap-up

According to the study's findings, disaster risk reduction, relocation to areas with fewer climate-related hazards, climate change awareness, and afforestation campaigns can all be used to improve community livelihoods in Somalia's Jowhar middle Shabelle region. As to the study's conclusion, the Jowhar district of Somalia's residents benefit greatly from the implementation of various initiatives, which in turn lead to improved livelihoods.

9. Recommendations

There is a need for improvement of the functionality of environmental protection efforts and policies of the government through enforcement programs. Enhancing Infrastructure Resilience
Promoting Green Spaces and Urban Planning, Diversifying Water Resources, Strengthening Early Warning Systems, Promoting Sustainable Agriculture Practices

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Measles Outbreak- Hodan District, Banadir Region, Somalia 30th May-7th June, 2023

ZEINAB ISMAIL ABDULLAHI

Abstract

Introduction: Measles is a highly contagious viral disease that can lead to severe complications and death, is caused by a virus in the paramyxovirus family, and is normally passed through direct contact and the air.

in Somalia the number of measles cases has been increasing as drought conditions intensified and the population susceptible to measles also increases. we investigated Measles To confirm the existence of an outbreak and to take appropriate action and prevent father spread of disease.

Objective: To conduct an investigation of measles outbreak and to put the necessary precautions in place between May 30 and June 7, 2023, in the Hodan District-Banadir Region of Mogadishu, Somalia.

Methods: we conducted a descriptive study, we used WHO standard case definition of measles and we used a questionnaire, and cases were epidemiologically linked to the lab. From May 30 to June 7 of 2023, we investigate suspected measles outbreak. The investigation was carried out in the Banadir area of the capital city of Mogadishu's Hodan district and. Sixteen blood samples were taken and delivered to the National Public Health Reference Laboratory for verification. We visit the affected households, healthcare provider in district, the EPI team who were on the scene when the outbreak started, and community health workers.

Result: result founds a total of 28 suspected Measles cases were reported in the Hodan District of Banadir region. Age group 0-4 years was found as the highest in among age groups. This could be attributed to the district's relatively large population of unvaccinated children and the low efficiency of the measles vaccine, which makes under 5 children more vulnerable. Twenty out of 28 cases reported were unvaccinated (Zero dose for valid measles vaccine). Ten out of 16 laboratory Specimen sent to central laboratory were positively confirmed and remaining 12 cases were epidemiologically linked to the outbreak.

Conclusions and recommendations: A total of 28 Measles Cases were reported from Hodan district; Black Sea Village was the highest reported subsection; this outbreak was High among under-five children; Females were reported higher than males; No deaths were reported during the study period. Routine community health education about importance of measles vaccination is very important, and to improve social mobilization community engagement and risk awareness and also There is need for regular vaccine campaigns to facilitate high coverage.

1.0. INTRODUCTION

Measles is a highly contagious viral disease that can lead to severe complications and death, is caused by a virus in the paramyxovirus family, and is normally passed through direct contact and the air. And measles is one of the world's most contagious diseases, spread by close or direct contact with infected nasal or throat secretions (coughing or sneezing). The first sign of measles is usually high fever, beginning about 10 to 14 days after exposure to the virus and lasting four to seven days. A runny nose, cough, red and watery eyes. A rash erupts after several days, usually on the face and upper neck. The rash spreads over about three days, eventually reaching the hands and feet, and lasts five to six days before fading. [1]

Measles commonly effects Any non-immune person (not vaccinated or vaccinated but did not develop immunity) can become infected. Unvaccinated young children, malnourished children and pregnant women are at highest risk of severe measles complications. [2]

The most serious complications include blindness, encephalitis (an infection that causes brain swelling), severe diarrhea and related dehydration, ear infections, or severe respiratory infections such as pneumonia. Severe measles is more likely among malnourished young children, especially those with insufficient vitamin A or weakened immune systems from HIV/AIDS or other diseases. The measles vaccine includes two doses and is recommended as part of the World Health Organization's expanded Programme on immunization. Protection following a two-shot regimen of measles vaccine is more than 95 per cent effective at preventing the disease and the duration of this protective effect is lifelong. [1]

As of November 5, 2019, measles continues in many parts of the world as an outbreak of 440,263 confirmed cases are reported to the World Health Organization (WHO) by 187 countries in 2019. [7].

In 2019, measles increased by more than twofold (120%) and 10-fold in Europe and Africa, respectively. [8]

In developing countries, an estimated 100,000 measles related death continue to occur each year until 2030. Despite availability of measles vaccination in many countries, measles continues to present threats to both unvaccinated and incompletely vaccinated individuals, which affects individual and population health and increase financial costs.[9]

In African countries measles remain a priority health problem and remains among one of the top causes of death in under five-year-old children. According to WHO report, measles caused an estimated 40,000 deaths annually in the African region in 2013.[10]

As of November 17, 2019, in Africa about 250,270 suspected cases with 5110 related deaths have been reported, an increase of 8000 cases compared to the same period of the previous year.[7]

In Somalia the number of measles cases has been increasing as drought conditions intensified and the population susceptible to measles also increases. Between 2 January and 5 March 2022, a total of 3509 suspected measles cases were reported from 18 regions in the country, largely from drought-affected districts. Of these 18 regions, six regions including Bay, Mudug, Banaadir, Bari, Lower Shabelle and Gedo reported the highest number of cases. A total of 249 samples were collected and tested at four laboratories in the country (in Garowe, Hargeisa, Kismayo and Mogadishu). Of these samples, 57% (142 samples) tested positive for measles Immunoglobulin M (IgM). 81% of the positive cases were less than five years of age.[11]

1.1 Problem statement

Measles cases in Somalia are immediately reportable diseases that are reported by healthcare facilities as suspect measles through the IDSR Surveillance. Upon reviewing the weekly surveillance report in the IDSR system on May 27, 2023, I found 10 cases of the measles recorded in the Hodan District in Epi Week 21, six of which were hospitalized to the Banadir Hospital. So, in order to define the scope, Confirm the outbreak's presence, and identify the causal factor, as well as to suggest and implement the necessary countermeasures we conducted a measles outbreak investigation between 30 May to 7 June 2023, at Hodan district, Mogadishu Somalia.

1.2 Objectives

1.2.1 General objectives

To conduct an investigation of measles outbreak and to put the necessary precautions in place between May 30 and June 7, 2023, in the Hodan District-Banadir Region of Mogadishu, Somalia.

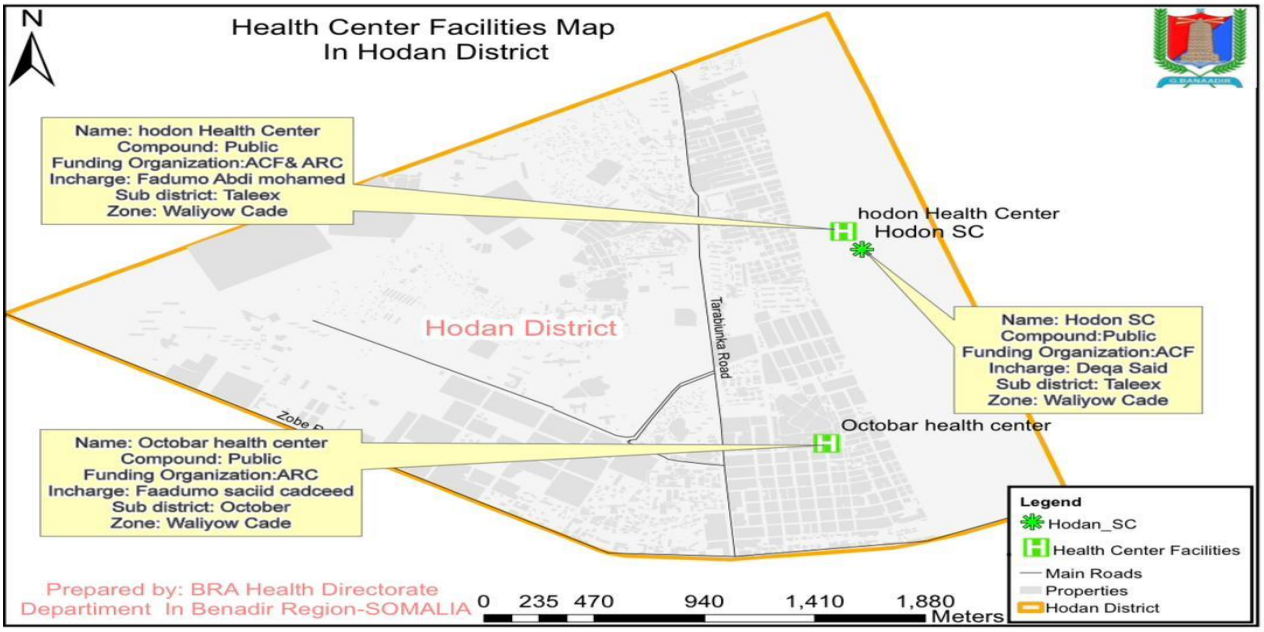
1.2.2 Specific objectives

- To confirm the existence of an outbreak of the measles in the Hodan district.
- To Characterize the outbreak (in person, place, and Time)
- To propose and take appropriate action to contain and prevent father spread of disease outbreaks

1.3 METHODS

1.3.1 Study Area and investigation period

From May 30 to June 7 of 2023, we investigate suspected measles outbreak. The investigation was carried out in the Benadir area of the capital city of Mogadishu's Hodan district. Hodan District is one of the 17 districts of Somalia's southeasterly Benadir region. Taleeh, Tarabuunka, Siigaale, and Black Sea are the four sub-village groups that make up the Hodan district. The Hodan district has a total population of 164941, according to PESS 2022. There are 51 health facilities in the district overall, 48 of which are private hospitals and three of which are governmental health institutions. There is no enough sewage infrastructure or garbage disposal facility nearby.



1.3.2 Study design

A descriptive study was conducted In the Hodan District from May 30 to June 7, 2023. We employed to characterize person, place, clinical feature, and vaccination statues, and time variables.

1.3.4 Case definition:

We used WHO standard case definition of measles as following.

Suspected case definition: Any Person with fever and generalized, spotty maculopapular, non-vesicular rash and one of the following: Cough (Coryza) or (conjunctivitis) residence in Hodan district from May30-June 7, 2023.

Confirmed case: Any suspected case residence in Hodan district and Confirmed by the laboratory (IGM positive) from May 30 – June 7, 2023.

1.3.5 Data collection procedure

We used a questionnaire, and cases were epidemiologically linked to the lab. Sixteen blood samples were taken and delivered to the National Public Health Reference Laboratory for verification. We visit the affected households, healthcare provider in district, the EPI team who were on the scene when the outbreak started, and community health workers.

1.3.6 Data Analysis

Using Microsoft Excel 2010, we conducted data analysis. To examine the data, we made use of tables, charts, graphs, and descriptive statistics.

1.3.7 Ethical consideration

From the National Institutes of Health, ethical approval was obtained. About performing the dengue fever inquiry, we spoke with the district health officer (DHO) of the Banadir region, and he formally granted his approval.

1.4 Results

1.4.1 Description of Cases by time, place and person

1.4.1.1 Distribution by personal variables

Table: 1 distribution of measles cases by age and sex in Hodan district- Mogadishu, Somalia 1 May-6 June 2023

Age group in year	Gender		Population	Attack Rate
	Male	Female		
0-4	10	12	23,092	9.5
5-9	2	4	28,040	2.1
10-14	0	0	23,092	0
15-64	0	0	87,419	0
*> 65	0	0	32,988	0

As shown in table, the age group 0–4yrs were the most affected in the current outbreak with 22 (78.57%) which 12 (42.86%) of them were females and 10(35.71%) were Males. The number of cases decreased among the older age group 5-9yrs 6(21.4%) which 4 (14.29%) of them were females and 2(7.14) were males and No cases above 10yrs are reported**.**

1.4.1.2 Distribution Measles outbreak by Place

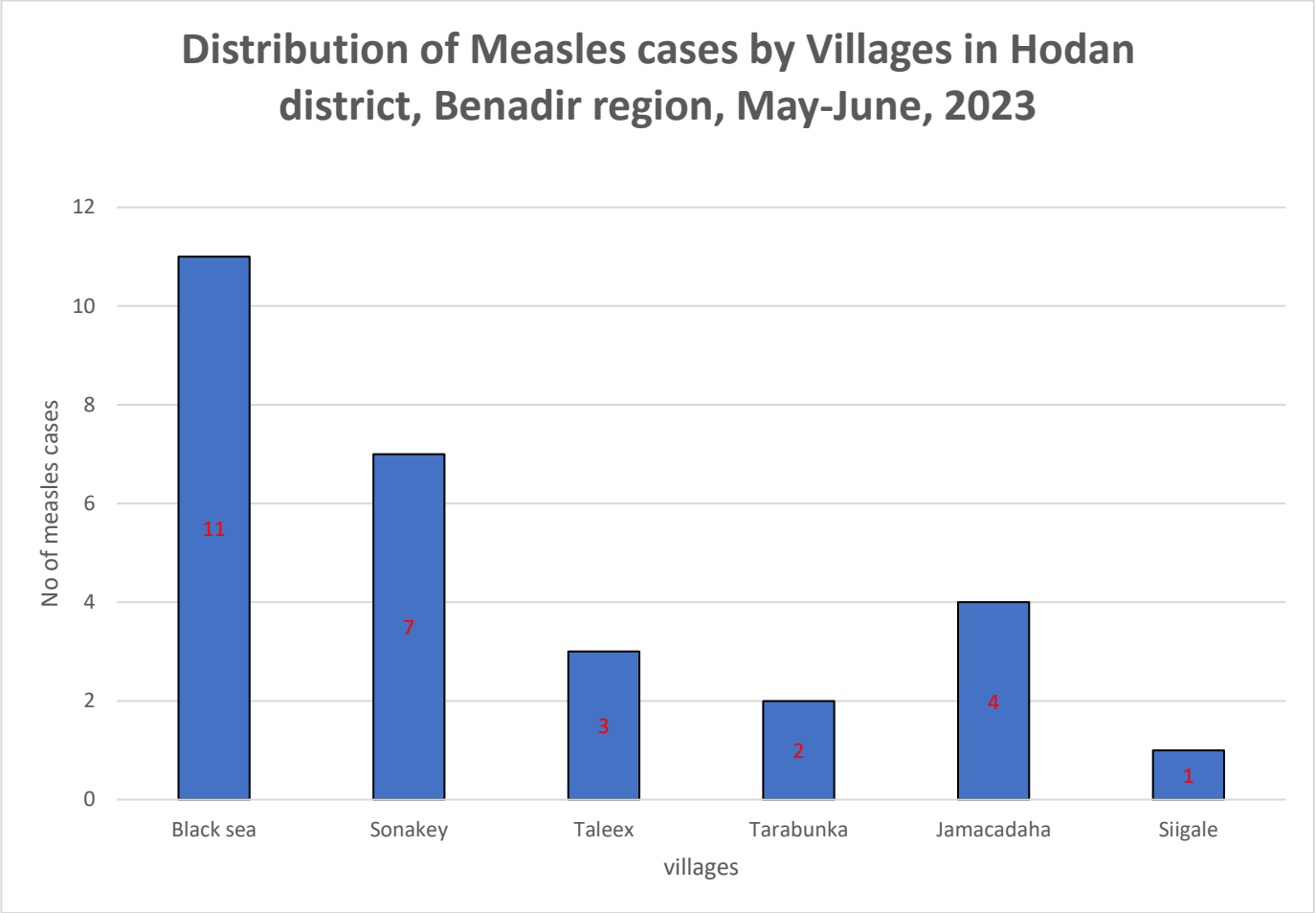


Figure 1: Distribution of Measles cases by Villages in Hodan district, Benadir region, May-June, 2023

This Figure shows that the Majority of Measles outbreak cases 11(39.3%) were from Black-Sea Village of Hodan district, the lowest case 1(3.57%) from sigale.

1.4.1.3 Distribution of Measles cases by Time

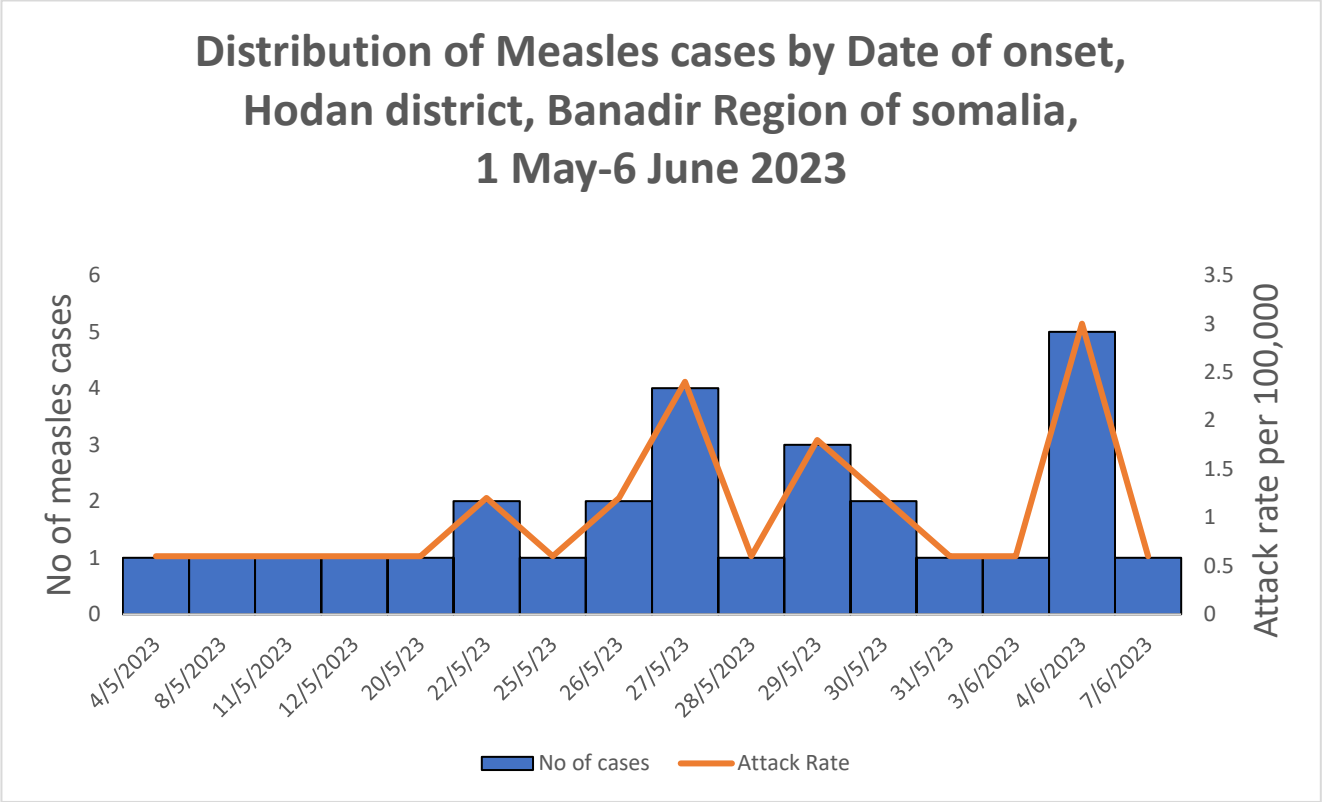


Figure 2: Distribution of Measles cases by date of onset of illness in Hodan district Benadir region, Somalia May-June, 2023

As shown in above figure the outbreaks started on May 4, 2023. The Epi curve has several peaks showing propagated type of transmission. The outbreak lasts for 32 days. The outbreak reached climax on May 27 and June 4 2023. And the first case developed with measles symptoms was seen on 5th May 2023 from soonakey village of Hodan district.

1.4.1.4 Distribution of Measles outbreak by Lab test Results

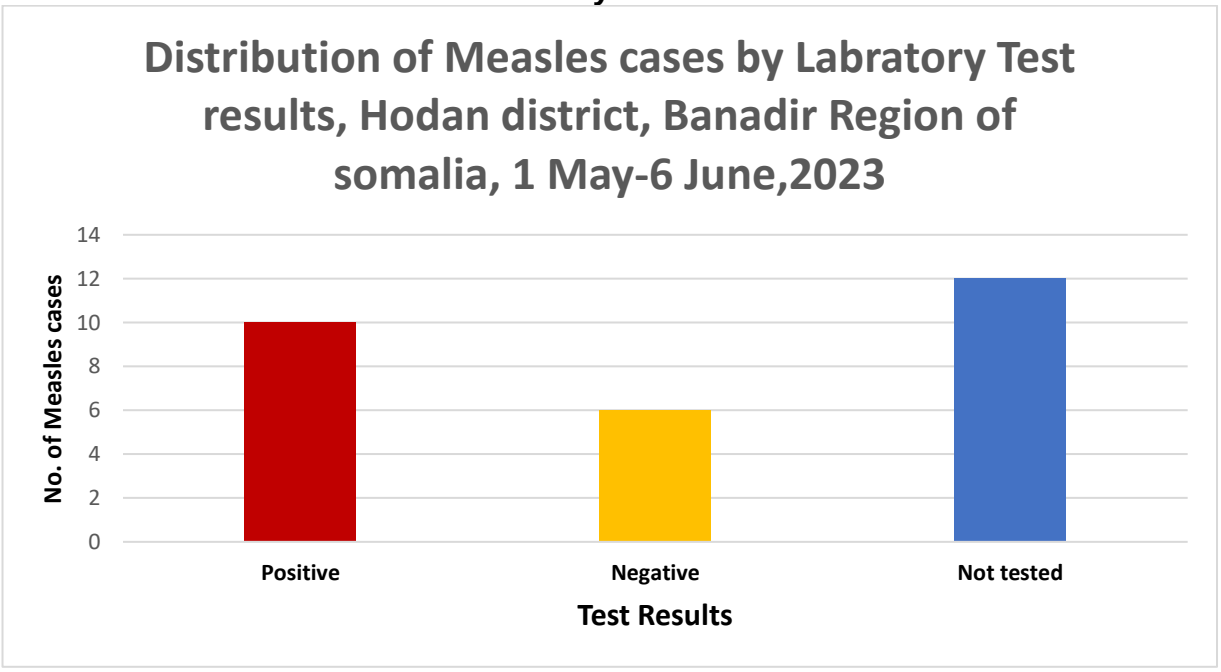


Figure 3: Distribution of Measles cases by Laboratory test results in Hodan district Benadir, somalia May-June, 2023

Ten cases (35.71 %) were laboratory confirmed 6 (21.43%) were negative and 12 (42.86%) cases were epidemiologically linked.

1.4.1.5 Distribution of measles outbreak by Clinical sign and Symptoms

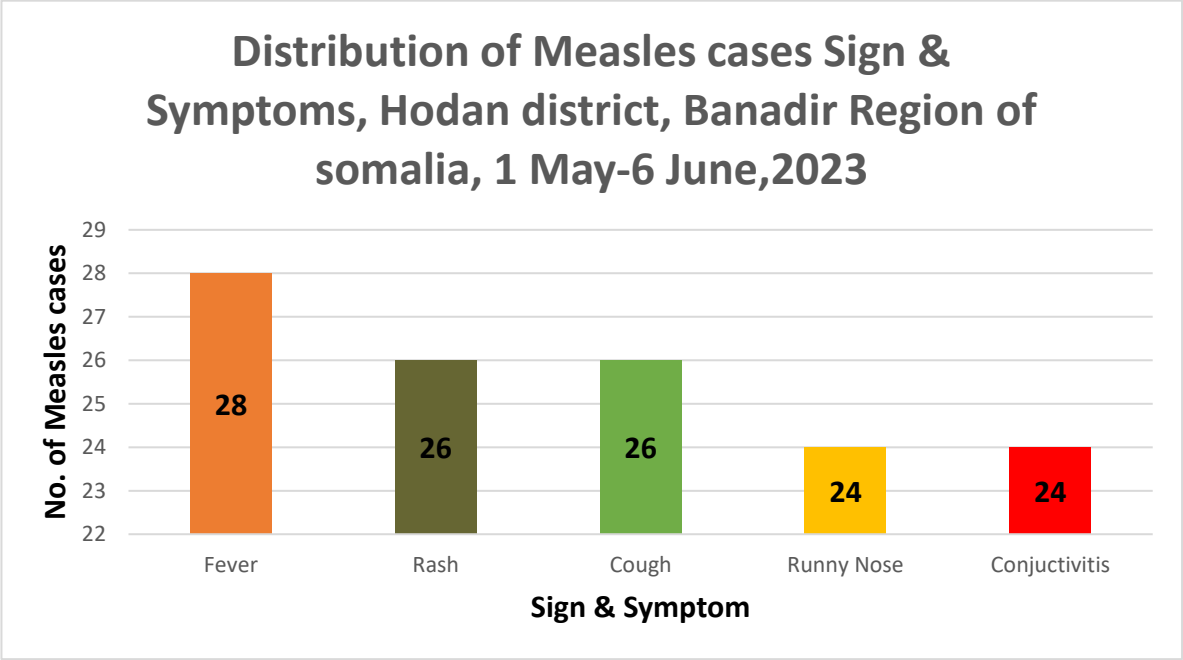


Figure 4: Distribution of Measles cases by Sign & symptoms in Hodan district, Benadir region, May-June, 2023

According to the results of this study all cases developed measles symptoms like fever 28 (100%), maculopapular rash and cough 26(92.86%) and 24 (85.71%) of the cases developed runny Nose and conjunctivitis.

1.4.1.6 Distribution of Measles cases by Measles Associated Complications

Table 2: Distribution of cases by Measles associated Complications in Hodan district, Banadir Region- Somalia, May- June 2023

S/N	Complications	Frequency	Percentage
1	Diarrhea	12	42.86%
3	Pneumonia	10	35.7%
4	Poor feeding	6	21.4%
5	Ear discharge	5	17.86%
7	Malnutrition	9	32.1%

Regarding complications, 12 (42.86%), 10 (35.7%), and Nine (32.1%) cases developed diarrhea, pneumonia, and Malnutrition, respectively

1.4.1.7 Distribution of Measles outbreak by Vaccine status

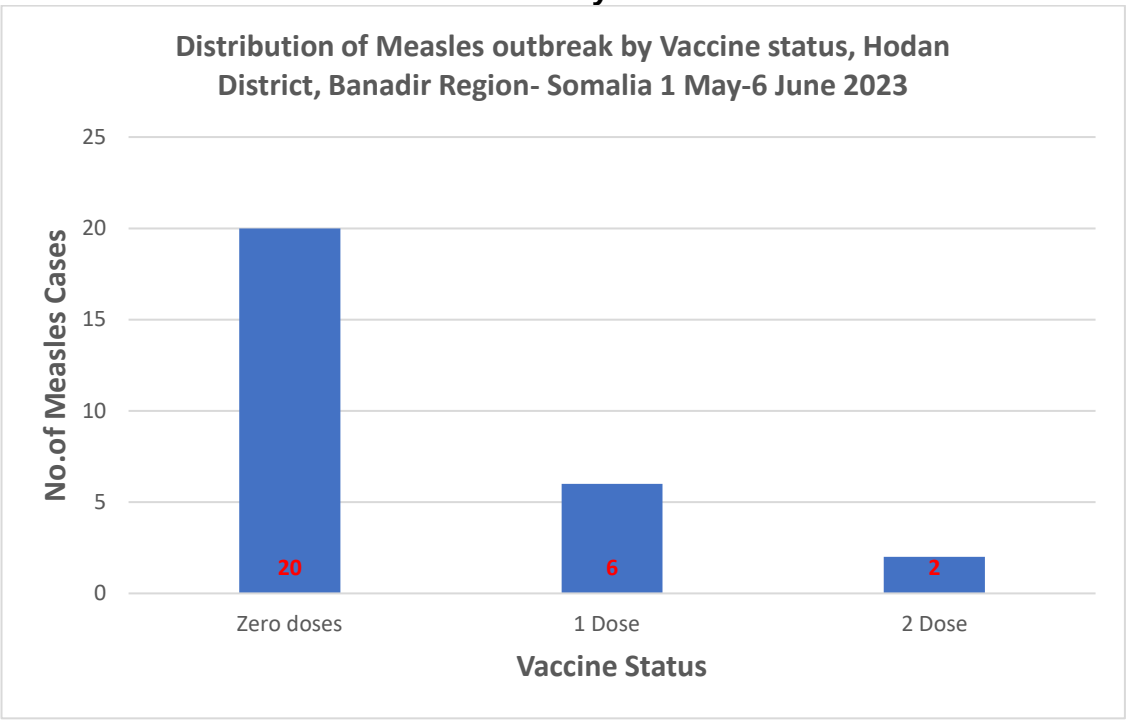


Figure 6: Distribution of Measles cases by Vaccine Status in Hodan, Benadir region, May-June, 2023

From the total of 28 measles cases registered Two (7.14%) of them were not eligible (less than nine months) for MCV1. Regarding vaccination with MCV of the 28 cases reported about 20 (71.43%) of them were unvaccinated and 6(21.43%) vaccinated with one dose only. Two dose vaccination status was two (7.14%)

1.5 Discussion

From May 2, 2023 to June 6, 2023, a total of 28 suspected Measles cases were reported in the Hodan District of Banadir region. Age group 0-4 years was found as the highest in among age groups. This could be attributed to the district's relatively large population of unvaccinated children and the low efficiency of the measles vaccine, which makes under 5 children more vulnerable. Twenty out of 28 cases reported were unvaccinated (Zero dose for valid measles vaccine). All 28 cases (100%) developed measles symptoms such as fever, maculopapular rash, and cough, while 24 (85.71%) experienced runny nose and conjunctivitis. Ten out of 16 laboratory Specimen sent to central laboratory were positively confirmed and remaining 12 cases were epidemiologically linked to the outbreak.

The outbreak reached climax on May 27 and June 4 2023. And the first case developed with measles symptoms was seen on 5th May 2023 from soonakey village of Hodan district.

This study findings were in line with the finding of studies conducted in Ethiopia, Guji and Bale Zones of the Oromia Region. [13]

Similar study conducted in Garda Marta District of Gamo Zone of Ethiopia that A total of 140 suspected Measles cases were reported from October 12, 2021, to March 09, 2022, with an overall attack rate and case fatality rate of 26/10,000 and 0.7%, respectively. A high AR was observed in the age category of 0–59 months. [12]

Our study finding was lower than the result of study finding conducted in India and Ethiopia.[14], [15]. and also lower compared with the expected CFR from measles between 3% and 6% in Ethiopia.1 Low CFR could be due to deaths not being registered at the community level, whereas, the data only count deaths at the health facility level. Moreover, it might be due to the establishment of a strong clinical case management system during an outbreak.

1.6 Study Limitation/ Challenges

- Laboratory limitation for case investigation and sample transportation
- Poor surveillance report of the health facilities
- Time limitation for outbark investigation

1.7 Actions Taken

- Training of health workers on strengthening the systems to ensure rapid detection, confirmation and response capacities;
- Community engagement and awareness on improving prevention and control measures.
- Training of community health workers infection prevention and control measures to reduce mortality; and implement appropriate public health measures to prevent the spread of the outbreak.

1.8 Conclusion

A total of 28 Measles Cases were reported from Hodan district; Black Sea Village was the highest reported subsection; this outbreak was High among under-five children; Females were reported higher than males; No deaths were reported during the study period, and the outbreak indicated that a Zero dose of valid measles vaccine and Low awareness among caregivers of the importance of vaccines and measles prevention and control were the highest risk factors.

1.9 Recommendations

- Routine health education about importance of measles vaccination is very important
- increasing routine immunization, including SIA, in the Banadir districts.
- increasing vaccination efficacy through better cold chain management, vaccine storage, and transportation
- The health workers should also be engaged in regular capacity building on vaccination, disease surveillance, control, and case managements to detect cases early and manage properly at the health facilities.
- There is need for regular vaccine campaigns to facilitate high coverage.
- To improve social mobilization community engagement and risk awareness,

- Raising awareness about the need of immunization for children is a crucial preventive step that should be done to prevent and control measles outbreaks.
- To improve the sample collection and transport from the facilities to the referral laboratory to confirm the cases and doing other laboratory investigations.
- To Enhancing immunization defaulter tracing during SIA and Polio campaigns through effective referral coordination and transportation facilities
- In addition, cohort study designs could be used to identify other factors that our study could not address.

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Our experience with blast and gunshot induced traumatic vascular injuries at Somalia's major vascular referral center

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Abstract:

Blast and gunshot-induced penetrating traumatic vascular injuries represent a significant portion of patients with vascular trauma in countries where there are higher rates of war-related violence. These injuries are especially challenging in resource-limited countries due to early diagnosis and transfer delays. This report aimed to present our experience regarding the surgical management and outcome of such injuries at a major referral vascular surgery centre in the country. A retrospective descriptive review of 326 patients with blast and gunshot-induced penetrating traumatic vascular injuries managed during a five-year period between April 2018 and April 2023. The demographics, mechanism of injury, type of vascular injury, Anatomical location, time to the operation, length of hospital stay, amount of blood products given, concomitant neuroskeletal injuries, development of Vascular injury associated acute kidney injury, surgical procedures performed and patient outcome were reviewed. In this study, 326 patients with 445 vascular injuries fulfilled the inclusion criteria. Most of the patients were male 92.3%, and the mean age was 28.3 ± 9.9 years. The gunshot mechanism of vascular injury was implicated in 76.1% of the injuries, and explosive-induced injury was 78 (23.9%).

193 (59.2%) of the patients had isolated arterial injuries, 117 (35.9%) patients had combined arterial and venous injuries while 18 (4.9%) patients had isolated venous injuries. The most commonly injured arteries were the femoral artery, followed by Brachial and popliteal artery injuries (26.1%, 23.5%

and 19.4%, respectively). The median time to revascularization was 8.8 ± 8.7 h. 46.8% of the patients had Concomitant fractures, while 26.5% had Concomitant nerve injuries. Only three patients had temporary non-heparin-bound shunts during their arrival. The most common surgical intervention in arterial injuries was reversed saphenous vein graft 46.1%. The mortality was 5.8% and 7.7% of

the patients needed secondary amputation. The majority of wartime arterial injuries are a result of Blast and gunshot vascular injuries. Frequent need for autologous vein grafts should be considered to manage such injuries. Results are encouraging despite delays in intervention; therefore, all viable limbs should be revascularized, keeping in mind the long-term functionality of the limb.

Keywords Vascular injuries, Trauma, Gunshot injuries, Blast injuries, Amputation

Introduction

Traumatic vascular injuries are considered infrequent but can cause significant morbidity and mortality in both civilian and military populations[1]. Due to higher rates of terror and civil war-related violence in the population, blast and gunshot-induced traumatic injuries are common in Somalia[2]. The conflict in Somalia has been dating back since the collapse of Siaad Barre's Government with varying degrees of intensity and dynamics throughout the years, with the root causes of conflict considered to be mainly terrorism and inter-clan conflicts[3].

Blast injuries result in devastating combinations of injuries that can affect multiple body systems.

They cause injuries through high-pressure blast waves, bomb fragments, violent displacement, collapse of infrastructure, and heat. Blast explosions in Somalia are mainly landmines, grenades and improvised explosive devices[2,4]. The nature of gunshot injury is determined by the anatomic location involved, the dynamics of the projectile and the local reaction of the penetrated tissue[5].

The mechanism and pattern of traumatic vascular injuries vary within the community in peace and war. In civilian practice, road accidents are considered the most common cause, but in countries with armed conflicts, penetrating traumas due to stab wounds, gunshots, and blast explosions are the most common cause of vascular injuries[6]. Surgical management of traumatic vascular injuries has evolved over time from where Ligation was the principal surgical strategy during World War I to an era where reversed vein grafts and prosthetic vascular grafts became widely used[7].

To date, bullet and blast-induced traumatic vascular injuries have been studied in different parts of the world[6]. However, the anatomical distributions, nature and management of vascular injuries affecting casualties in Somalia, where explosions and gunshot-related violence are usually intense, have not been studied in detail.

Our hospital is located in Mogadishu, the capital city of Somalia. It was opened based on a protocol signed by the health ministries of the two countries Somalia and Türkiye to develop the cooperation between the coun- tries in the field of health and medicine. The hospital is a major referral vascular surgery Centre for the country, where patients from Mogadishu and other parts of the country with traumatic vascular injuries are referred. In this study, we aimed to share our experience on anatomic distribution, associated injuries, surgical treatment techniques, and the outcomes of Bullet and blast-induced traumatic vascular injuries that were treated in our hospital over a period of five years.

Method

This study was designed as a retrospective descriptive study of 5 years between April 2018 and April 2023 con- ducted in the Department of Vascular Surgery of Mogadishu, Somalia, Turkey, Recep Tayyip Erdogan Research and Training Hospital. The data of this article was retrieved from the FONET electronic system of the hospital and is available from the corresponding author on reasonable request. It was reviewed retrospectively by a single investigator, and medical data of all patients with traumatic vascular injuries was collected by single investiga- tor. Patients with blast and gunshot-induced traumatic vascular injuries who had undergone revascularization were included in the study, while patients with other causes of traumatic vascular injuries or with digital artery injuries were excluded from the study. Patients who had non-salvageable traumatic limb loss or those who needed lifesaving primary amputations were excluded from the study. Ethical approval was obtained from the hospital's ethics committee with reference number (MSTH/4776) and was performed in accordance with relevant guidelines and regulations. Informed consent was obtained from all participants and/or their legal guardians.

Data collected included age, gender, mechanism of injury, type of vascular injury, Anatomical location, timing (from the point of wounding to the operation table), length of hospital stay, amount of blood products given, concomitant neuroskeletal injuries, development of Vascular injury associated acute kidney injury, surgical procedures performed and patient outcome (Recovery, Secondary amputation and death).

Patients were initially resuscitated according to Advanced Trauma Life Support guidelines. diagnosis of vascular injury was achieved through a physical examination with the assistance of hand Doppler, colour flow Doppler ultrasound and computed tomography angiography on patients with persistent pulse discrepancies and hemodynamic stability or surgical exploration for patients with hard signs of arterial injury[8]. Associated bone fractures were assessed with relevant X-rays where indicated. The decision to proceed with vascular repair rather than primary amputation when patients came after 6 h of injury, and patients could not move their toes or ankle was based on the viability of the distal muscle by open fasciotomy and observation of the contractile response of muscle to direct stimulation.

Standard surgical techniques for revascularization were used. After the incision, Proximal and distal control was obtained. A bolus of 100 IU/kg of heparin was administered. Inflow and backflow were assessed, and a thrombectomy was performed. This was followed by definitive repair with end-to-end anastomosis, Primary repair, interposition of Great saphenous vein graft, Cephalic or basilic vein graft interposition in a few cases with brachial artery injury, or Polytetrafluoroethylene grafts. Orthopaedic fixation was performed after vascular repair to reduce the duration of ischaemia if there were accompanying bone injuries. Nerve injuries identified were primarily repaired.

For the purpose of this study, Explosive injury was defined as acute injury arising from a blast mechanism with penetrating explosive fragments (i.e. secondary blast injury). Gunshot-related injury was defined as

when there was acute physical injury caused by gunshots. Primary amputation was defined as amputation performed without any attempt revascularization due to traumatic limb loss or those who needed lifesaving immediate amputations. Secondary amputation was defined as amputation performed after an attempt of limb salvage. The presence of Vascular injury associated kidney injury was defined as an abrupt (within 48 h) reduction in kidney function, diagnosed with an absolute increase in Serum creatinine of more than or equal to 26.4 μmol/l[9]. The statistical analysis of this study was performed with the use of Statistical Package for Social Sciences Version 23.0 software (SPSS Inc., Chicago, IL, USA). Variables were compared by using Chi-square analysis or the Fisher exact test. *P* values ≤ 0.05 were considered statistically significant.

Ethical approval

Ethical approval and consent for publication was obtained from the hospital's ethics committee with reference number (MSTH/4776).

Results

In a period of 5 years, a total of 458 patients with traumatic vascular injuries were managed in our hospital. Among these patients, 326 patients had blast, and gunshots induced traumatic vascular injuries and were candidates for the inclusion criteria. 301 (92.3%) of our study population were male while 25 (7.7%) were female. The age of the patients ranged from 7 to 66 years old, and the mean age of 28.3 ± 9.9 years. The gunshot mechanism of vascular injury was implicated in most of the cases, 248 (76.1%), and explosive-induced injury was 78 (23.9%). The mean time from the incident to the operation table was 8.8 ± 8.7 h, and the length of hospital stay was 10.3 ± 9.0 days. Demographic data are summarized in Table 1.

There were 445 vascular injuries in these 326 patients. 193 (59.2%) patients had isolated arterial injuries, 117 (35.9%) patients had combined arterial and venous injuries while 18 (4.9%) patients had isolated venous injuries. The Anatomical distribution of arterial injuries is summarized in Table 2, revealing that the femoral artery is the most common artery injured, followed by Brachial and popliteal artery injuries (26.1%, 23.5% and 19.4%, respectively). Venous injuries are summarized in Table 3.

In patients with arterial injuries, 145 (46.8%) patients had Concomitant fractures and needed orthopaedic intervention, while 82 (26.5%) patients had Concomitant peripheral nerve injuries. The distribution of fracture and nerve injuries according to the anatomical distribution of arterial injuries can be seen in Table 2.

As shown in Table 4, the primary surgical interventions undertaken in arterial vascular injuries were Reversed Saphenous vein graft (n = 310 [46.1%]) followed by End-to-end anastomosis (n = 310 [39.7%]). Venous vascular injuries were managed mainly with Primary repair (n = 135 [37.0%]) and Reversed Saphenous vein graft (n = 135 [18.5%]). Five patients with common femoral and iliac venous injuries were managed with Spiral saphenous vein grafts. Only three patients came to the hospital with temporary non-heparin-bound shunts, although none of them were patent during their arrival. Surgical interventions of the vascular injuries were conducted by Car- diovascular Surgery specialists and the residents' team.

Postoperative follow-up of the patients revealed that 268 (86.5%) of the patients with arterial injury recovered, 24 (7.7%) of the patients underwent secondary amputation, and 14 (5.8%) of the patients Died. Popliteal artery injury, followed by femoral artery injury, was associated with most of the amputations and deaths. 14 (23.3%) of the patients with popliteal artery injury underwent secondary amputation, while 6 (10.0%) died. On the other hand, Secondary amputation or mortality of the patients with femoral artery injury was 8 (10.0%). In terms of upper limb vascular injuries, only two patients with brachial artery injuries died, and one of these patients had a massive epidural hematoma.

Patient demographics	Number	%
Age (years)	28.3 ± 9.9	
Gender		
Male	301	92.3%
Female	25	7.7%
Mechanism		
Gunshot injury	248	76.1%
Blast injuries	78	23.9%
Blood products	8.4 ± 8.3	
Hospital stay (days)	10.3 ± 9.0	
Time to the operation room (h)	8.8 ± 8 .7	

Table 1. Patient demographics data.

Arterial injury n = 310	Associated acute kidney injury n = 23		Neuroskeletal Injury		Outcome n = 310		
			Fracture n = 145	Nerve injury n = 82	Recovery	Secondary amputation	Death
Carotid artery	12 (3.9%)	–	–	–	10	0	2
Subclavian Artery	6 (1.9%)	–	1 (0.7%)	4 (4.9%)	6	0	0
Axillary artery	15 (4.8%)	–	1 (0.7%)	11 (13.4%)	15	0	0
Brachial artery	73 (23.5%)	4 (17.4%)	32 (22.1%)	17 (20.7%)	71	0	2

Radial/Ulnar artery	20 (6.5%)	–	12 (8.3%)	10 (12.2%)	20	0	0
Iliac Artery	3 (1.0%)	1 (4.4%)	–	–	3	0	0
Femoral artery	81 (26.1%)	7 (30.4%)	25 (17.2%)	17 (20.7%)	65	8	8
Popleteal artery	60 (19.4%)	11 (47.8%)	42 (28.9%)	15 (18.3%)	40	14	6
Infrapopliteal arteries	40 (12.9%)	–	32 (22.1%)	8 (9.8%)	38	2	0
Total	310 (100%)	23 (100%)	145 (100%)	82 (100%)	268 (86.5%)	24 (7.7%)	18 (5.8%)

Table 2. The anatomical distribution, Associated acute Kidney injury, Neuroskeletal Injury and outcome of arterial injuries.

	N	%
Jegular vein	3	2.2
Subclavian vein	1	0.7
Axillary vein	8	5.9
Basilic/Cephalic/Brachia vein	30	22.2
IVC	5	3.7
Iliac vein	6	4.5
Femoral vein	47	34.8
Popliteal vein	35	26.0
Total	135	100

Table 3. Anatomical distribution of venous injuries.

	Arterial injuries n = 310	Venous injuries n = 135
Primary repair	13 (4.2%)	50 (37.0%)
End-to-end anastomosis	123 (39.7%)	19 (14.1%)
Reversed Saphenous vein graft	143 (46.1%)	25 (18.5%)
Spiral saphenous vein graft	–	5 (3.7%)
Cephalic vein graft	3 (1.0%)	–
Patch repair	–	11 (8.2%)
Synthetic graft	12 (3.9%)	5 (3.7%)
Ligation	16 (5.1%)	20 (14.8%)
Total	310 (100.0%)	135 (100.0%)

Table 4. Surgical treatment modalities for vascular injuries.

The overall prevalence of acute kidney injury in this study was 24(7.4%), and most of the AKI's were associated with popliteal and femoral artery injuries, 47.8% and 30.4%, respectively. There was a strong association between the number of blood products transfused and the development of acute kidney injury ($p < 0.001$).

Discussion

In many parts of the world, trauma has emerged as a major public health issue, with vascular trauma playing a significant role. Penetrating traumas, like stab, gunshot wounds, and blast injuries, as well as traffic accidents, account for a large percentage of these wounds[10]. According to our analysis, the majority of the patients with traumatic vascular injury are victims of fragment wounds from explosive devices or gunshot wounds due to higher rates of terror and civil war-related violence in Somalia, with most of them being males in their twenties.

The femoral artery, followed by Brachial and popliteal artery injuries, were the most common injured arteries in our study. This is similar to the pattern of war-related vascular injuries reported by Jawas et al.[6].

Vascular structures often lie in close proximity to nerves and bones; associated skeletal and nerve injury occurred in 44.5 and 25% of the patients, respectively. Most of the fractures were related with popliteal artery injury followed by infra-popliteal and brachial artery injuries. The rate of skeletal injury in our study is high com- pared to other reports, and the reason for that could be the high-kinetic energy mechanism of such injuries[11,12]. The extent of vascular injury determines the best course of vascular restoration. Most of the blast and gunshot- exposed arterial injuries had a segmental loss of > 2 cm and needed Reversed Saphenous vein graft in 46.1% of the cases. The frequent use of autologous vein grafts in wartime arterial injuries has been supported by manystudies in the literature [7,13].

For most of the first half of the twentieth century, regular venous ligation had been the standard procedure of venous injury management. However, the importance of venous restoration was later highlighted to prevent a low-flow state, with particular attention to the popliteal region[14]. Venous ligation was only 14.8% in our experi- ence, and most of the venous injuries were managed with primary venous repair. It is possible that the

aggressive management of venous injuries contributed to a good outcome despite our patients' delayed presentation. Con- comitant Femoral, followed by popliteal arterio-venous injuries, were the most common types of vascular injury, with the highest mortality and secondary amputation.

The most lethal arterial injury in our series is the popliteal artery, which was associated with 58.3% of the secondary amputations and 33.3% of the deaths among the patients. Injury to this artery was also responsible for 47.8% of vascular injuries associated with acute kidney injury. In multiple studies, injury to this vessel was recognized as the most difficult and dangerous injury and was associated with the highest rate of limb loss[15–17]. The unique anatomy of this vessel, the difficulty of surgical exposure, and commonly associated injuries like venous injury, fracture, nerve injury, and other associated soft tissue injuries contribute to its surgical challenge[17]

Our study shows a secondary amputation rate of 24 (7.7%) and death of 14 (5.8%). Due to absence of well-organized casualty care, limited facilities and expertise to manage vascular injuries in different parts of Somalia coupled with delays in early diagnosis and transfer, led to an increase of time between the incident areas to the operation table.

Despite delayed revascularization with a time to operation of 8.8 h, the overall limb salvage and survival rate after vascular repair is remarkable in this series and compares with other recent reports. Iraj and Velinovic reported a secondary amputation rate of 6.9% and 12.3% respectively, and Fahad et al. reported a mortality of 5.48% in their 10 years' experience of vascular injuries in a single centre in Karachi, Pakistan[12,18,19].

Patients with vascular trauma are at risk of acute kidney injury caused by renal hypoperfusion (secondary to haemorrhagic shock), rhabdomyolysis, or the nephrotoxic effects of therapies[20]. The incidence of post-traumatic AKI varies widely in different studies; in our study the rate of AKI after Vascular injury was 7.4%. Anatole reported the overall incidence of acute kidney injury among trauma patients in the multicenter trauma registry as 13%, but the incidence rose up to 42.5% in patients presenting with hemorrhagic shock[20]. We have seen that there was a strong association between the numbers of blood products transfused with the development of acute kidney injury.

We did not encounter a significant number of acute kidney injury, Secondary amputation and mortality in this series despite our approach to revascularize all viable limbs with long periods of ischemia. This suggests that delayed revascularization should not be discouraged based only on ischemia time. The severity of tissue ischemia depends not only on its duration but also on the efficiency of collateral circulation, the level of arterial injury and the extent of soft tissue damage[21]. De Silva et al. outlined that they did not encounter clinically significant systemic effects from reperfusion in their series of seventy patients despite accepting patients with long periods of ischemia and with non-contractile muscles in up to two compartments[22]. It is also important to emphasize that limb salvage is not enough on its own, but the long-term functionality of the limb must be taken into account, which frequently depends on the severity and rate of recovery from related neuromuscular and skeletal impairments. Based on this experience, we also highlight the need for organized casualty care and vascular surgeons or trauma surgeons who can perform vascular surgery in low-income countries where war- related vascular injuries are common.

Although promising, this study contained several limitations. In addition to the retrospective design, we were unable to follow up on the long-term functionality of the limbs of patients who presented late, but their limbs survived and were discharged due to their low socioeconomic status and lack of health insurance. Despite this, our study presents a comprehensive work describing the nature and challenges of blast and gunshot-induced traumatic vascular injuries in a population where such injuries are common.

Data availability

The data of this article was retrieved from the FONET electronic system of the hospital and is available from the corresponding author on reasonable request.

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