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The Research and Development Department of the Somali International University would like to acknowledge all supporters, organisers and participants of the 2nd SIU Annual Interdisciplinary Conference held on the 23-26 October 2021.

First, we would like to thank all researchers and practitioners who presented papers at the conference and made valuable contributions.

Second, we express our profound gratitude to Hormuud Telecom for financially supporting the conference. We also thank Signjet for offering us a significant discount on all printing and design of conference materials.

Finally, we thank everyone who participated in the conference and contributed to the conference's success.

Introduction

The Somali international University would like to take this opportunity to thank everyone who presented a paper at the SIU 2nd Annual Interdisciplinary Conference. The Research and Development Department of the Somali International University (SIU) embarked upon preparing an in-house publication of the conference proceedings after a successful conclusion of the 2nd SIU Annual Multidisciplinary Conference. We encouraged all researchers, faculty members and other practitioners who presented papers at the conference to submit a complete article for consideration for SIU in-house publication. Consequently, many researchers, practitioners and faculty members who presented papers at the conference responded to our call for submissions and submitted complete papers. All submitted papers underwent a thorough review, and the ten research papers included in this publication were selected.

Research papers included in this in-house publication discuss various essential and timely topics. The publication is divided into three parts. After the acknowledgement and introductory section, the first part discusses topics pertaining to public health and education issues. The second part addresses issues concerning agricultural development, poverty reduction, environment. The research papers in the third and final part deal with engineering, technology, public relations and international relations.

We are confident that the publication of this conference proceeding provides a platform to disseminate the conference contents and enhance the visibility of research findings through electronic channels and libraries.

Part I

Public Health and Education

COMMUNITY PERCEPTION REGARDING COVID-19 VACCINATIONS A CROSS-SECTIONAL STUDY IN MOGADISHU- SOMALIA

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ABSTRACT

Vaccine hesitancy could threaten global public health since there has been an unprecedented global effort to produce a vaccine to combat the COVID-19 pandemic. The outbreak of this communicable disease has affected the population of many families and has also disrupted the economy and development of the nation. Several vaccines are approved to fight against coronavirus disease (COVID-19) and administered globally in several regions. Hesitation in administering vaccines poses a severe challenge in achieving immunity coverage to a broader population.

The main objective of this study is to assess the community perception regarding COVID-19 vaccination—a cross-sectional study in Mogadishu, the capital city of Somalia. The study will apply a descriptive research method with a specific cross-sectional survey using the community's designed questionnaires. This study was conducted in Mogadishu, the capital city of Somalia, and the target population was 300 participants. The researcher analysed the size of the scale using a range of confidence levels and commitment. The researcher received a data sample from 240 participants and applied the probability sampling method. Data were collected within the timescale of 40 days, from the 15th of April to the 24th of May 2021.

The results show that 83.7% of the respondents know the COVID-19 vaccine. 70.6% of the respondents know about the effectiveness of the COVID-19 vaccine. 72.3% of the respondents believe it's dangerous to get vaccinated. 75.1% of the respondents are unsure if the vaccination can cause an allergic reaction. Ninety-seven respondents (40.8%) agreed that the newly discovered COVID-19 vaccine is safe. This was followed by a response from 92 participants (38.5%) who agreed on the COVID-19 vaccine being essential

to the population. The participants had exciting responses on their perception of the COVID-19 vaccine. 67.6% of the respondents agreed on the free-of-charge administration of the vaccine in Somalia, 55.6% of the respondents perceived COVID-19 vaccines could not cause infertility. Lastly, 47% of the respondents were unsure if COVID-19 vaccines can cause blood clots. The current study provided a thorough review of the community perception in relation to COVID-19 vaccinations. According to the results, Somalis have an adequate degree of knowledge and awareness on COVID-19 and are generally optimistic about eradicating the pandemic.

Keywords: Coronavirus, Knowledge, Attitude, Community perception, COVID-19 vaccine.

1. INTRODUCTION

Coronavirus is a pandemic disease that can cause severe infection and is spreading over the globe [1]. SARS-CoV-2, the most recent coronavirus strain, has caused a severe public health crisis worldwide [2,3]. The coronavirus pandemic has had a wide range of multifarious impacts across the planet. The virus epidemic and transmissibility impacted the lives of many families and disrupted the economies and development of the countries [4]. Vaccination is a structured approach to stop germs and reduce mortality in infectious diseases such as influenza and the human papillomavirus [5]. The contamination, however, has broken the vaccine supporters and their anti-vaccine complements [6]. Vaccine hesitation is a behaviour characterised by a delay in accepting vaccines in the face of available services.

In 2019, the World Health Organization (WHO) declared it a global health threat. Vaccine hesitancy is comprised of three major components. (i) Individuals may lack trust in vaccines and be afraid of getting vaccinated, especially if they are misinterpreted as posing a risk of infection [7]. (ii) Individuals don't see the need for a vaccine (for example, due to an underestimation of disease severity), or don't see the vaccine as applicable, and (iii) Individuals, groups, or communities may face challenges in obtaining the vaccine (World Health Organization, 2015).

Vaccine delay had the most significant impact on vaccine uptake in the general population [8,9]. In 2019, ten years after the 2009 influenza pandemic, about half of the United States of America population did not have a seasonal influenza vaccine [10]. COVID-19 vaccination ensures that the general pop-

ulation and healthcare practitioners are both prepared for the COVID-19 vaccine [11]. To manage COVID-19 with vaccination, a significant fraction of the population would have to accept and receive the vaccine [12]. If the vaccine is well implemented, it has the potential to reduce the pandemic load quickly and effectively [13]. However, there must be widespread public acceptance and coverage. As a result, interpreting the opinions of beneficiary populations prior to immunisation funding is critical, especially in resource-poor countries [14]. Because SARS-CoV-2 is a highly transmissible virus that affects residents worldwide, vaccinations are the most vital public health estimate and the best approach for protecting the population against COVID-19. The fight against the COVID-19 vaccine approach, as well as progress against the disorder's unfolding and disastrous consequences, is ongoing [15].

Now, as we pass through the epidemic, we may be able to spread less sophisticated vaccinations. With vaccine administration undertaken, it is fundamental to appear to be at the neighbourhood taking COVID-19 vaccinations [16]. On the 15th of March, 2021, Somalia's government acknowledged adopting the AstraZeneca vaccination from India as the primary beneficiary of the COVID-19 vaccine [17]. However, there is a dispute between communities and the coronavirus vaccine [18].

The AstraZeneca vaccine is recommended for persons with comorbidities linked to an increased risk of severe COVID-19 infection, such as obesity disorder, respiratory disease, or diabetes. Further research is needed for persons living with HIV or auto-immune disorders or who are immunocompromised. Those in these categories who live in a gaggle neighbourhood

2. THE GENERAL OBJECTIVE OF THE STUDY

The principal objective of this study is to assess the community perception in regards to COVID-19 vaccinations, a cross-sectional study in Mogadishu, Somalia.

Specific objectives:

1. To identify knowledge base related to COVID-19 vaccinations: a cross-sectional study in Mogadishu, Somalia.
2. To describe the attitude towards COVID-19 vaccinations: a cross-sectional study in Mogadishu, Somalia.

3. METHODS AND MATERIALS

3.1 STUDY AREA

This study is conducted in Mogadishu, the capital city of Somalia and the location is the Banadir region. The Banadir region is close to the Indian Ocean and has long served as an important port. It has a population of 2,587,183 residents as of 2019 (world meter 2019). More than 29 years of civil war has virtually destroyed Mogadishu, but things are beginning to change. It consists of seventeen districts. Due to time constraints, the survey ran for 40 days and was proposed to 300 respondents.

3.2 STUDY DESIGN

With the goal of generalising from a sample to a population, the study used descriptive research with a cross-sectional survey employing developed questionnaires of community perception on COVID-19 Vaccination.

3.3 SAMPLE SIZE

The intended population was 300 participants. However, the researcher used a range of commitment and confidence levels to determine the scale's size. The researcher got a sample of 240 persons and applied probability sampling as the sampling method.

3.4 DATE COLLECTION

This study collected primary data through the use of a questionnaire to gather basic information. Data were collected for 40 days, from the 15th of April to the 24th of May 2021.

3.5 DATA ANALYSIS

This study will apply descriptive research with a mean and standard variation. The application software SPSS version 20 will be used to analyse the data.

3.6 ETHICAL CONSIDERATIONS

The written moral approval and clearance were obtained from the lookup ethics committee at Somali International University (SIU). Participation was voluntary, and the participants were not compelled to participate in the study. Even those who had previously planned to participate were free to withdraw from the discussion if they no longer desired to do so.

RESULTS

This paper shows the profile information of respondents in the survey about community perception regarding COVID-19 vaccinations—a cross-sectional study in Mogadishu, Somalia.

SURVEY DEMOGRAPHICS

Descriptive statistics were used to demonstrate the demographic characteristics of the participants, which could have an influence on the respondents' feedback to this survey. Respondents were asked to provide information on their age, gender, marital status, and educational background. As shown in Table 1, their responses were summarised using frequencies and percentage distributions.

TABLE 1: PROFILE OF RESPONDENTS

Category	Frequency	Percent
Age		
18-25 years	88	36.7
26-30 years	86	35.8
31-35 years	46	19.1
36 years and above	20	8.4
Total	240	100
Gender		
Male	179	74.5
Female	61	25.5
Total	240	100
Marital Status		
Single	119	49.6
Married	117	48.7
Divorced	4	1.7
Total	240	100
Educational Background		
Had never gone to School	3	1.24
Primary education	4	1.54
Secondary education	7	3.51
Bachelor's degree	155	64.3
Master's degree	63	26.1
Doctorate degree	8	3.31
Total	240	100

According to the findings in table 1, the majority of respondents (72.5%) were between the ages of 18 and 30. The majority of the participants (74.5%) were male. There was a close margin between the single and married participants at 49.6% and 48.7%, respectively. A significant percentage of the participants (64.3%) held Bachelor's degrees.

Table 2: Knowledge of COVID-19 vaccine

Statement / Questions	Yes	No	Not sure	Total
Do you know about COVID-19 vaccine?	83.7%	16.3%	0	239
Do you know about the effectiveness of the COVID-19 vaccine?	70.6%	29.4%	0	238
Is it dangerous to use the vaccine?	72.3%	27.7%	0	235
Does vaccination increase allergic reactions?	6.3%	18.6%	75.1%	237
Does vaccination increase auto-immune diseases?	14.6%	47.7%	37.7%	239

As shown in table 2, 83.7% of the respondents are aware of the COVID-19 vaccine. 70.6% understand the effectiveness of the COVID-19 vaccine, while 72.3% of the respondents believe it's dangerous to use the vaccines. 75.1% are unsure whether vaccination increases allergic reactions, and 47.7% believe vaccination does not increase auto-immune diseases

Table 3: Attitude of COVID-19 vaccine

Statements / Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Total
Is the newly discovered COVID-19 vaccine safe?	28	97	78	28	7	238
Is the COVID-19 vaccine essential for us?	58	92	57	25	7	239
Are you taking the COVID-19 vaccine without any hesitation?	29	79	54	64	12	238
Can you encourage your family/ friends/relatives to get vaccinated?	59	80	42	46	12	239
Is it beyond the realm of imagination to expect to reduce the rate of COVID-19 without inoculation?	37	76	50	59	14	236
Is the COVID-19 immunisation ought to be dispersed decently to us all?	45	83	49	47	14	238

The Likert scale range was applied as indicated in table 3 to measure the agreement level of the participants' attitude towards the COVID-19 vaccine. The range was from 'strongly agree' with 5 points to 'strongly disagree' with 1 point.

According to table 3, the majority of respondents, 97 (40.8%), agreed that the newly discovered COVID-19 vaccine is safe, and 92 respondents (38.5%) agreed that the COVID-19 vaccination is necessary for us. Seventy-nine individuals (33.2%) indicated that they took the COVID-19 immunisation without hesitation. Eighty respondents (33.5%) agreed that they would advise their families, friends, and relatives to get vaccinated.

Feedback from 76 respondents (32.2%) agreed that they believe there it is not possible to reduce the incidence of COVID-19 without vaccination, and 83 respondents (34.9%) agreed that the COVID-19 vaccine should be distributed fairly to all of us.

Table 4: Perception of Covid 19 vaccine

Statements / Questions	Yes	No	Not sure	Total
Do you think the newly found COVID-19 antibody may have incidental effects?	120	16	102	238
Do you believe that if everybody in the general public keeps up with the preventive measures, the COVID-19 pandemic can be destroyed without inoculation?	77	77	83	237
Do you think the antibody should be administered free of charge in Somalia?	161	30	47	238
Do you think that if you get the COVID-19 vaccine you will become infertile?	28	130	76	234
Do you think that if you get the COVID-19 vaccine you will have blood clot?	63	61	110	234

According to the findings in Table 4, 50.4% of the participants believe that the newly developed COVID-19 vaccine may have side effects. 35% were unsure whether the pandemic could be exterminated without vaccination if everyone in society followed the COVID-19 preventive measures. The vaccine should be freely administered in Somalia, according to 67.6% of responders. 55.6% of respondents do not believe COVID-19 vaccines can cause infertility, while 47% are unsure whether COVID-19 vaccines can cause a blood clot.

Table 5: Who should be vaccinated?

Statement	Frequency	Percentage
Those who have not yet been infected	53	22.6
People infected with COVID-19	32	13.6
Newly recovered from COVID-19	13	5.5
Everyone	137	58.3
Total	235	100

Table 5, 22.6% agree that individuals who have not yet been afflicted should receive the vaccine. 13.6% of respondents feel vaccines should be given to people infected with COVID-19. 5.5% believe recently recovered COVID-19 patients should be vaccinated, and 58.3% say everyone should be vaccinated

Table 6: Who's supposed to be vaccinated first?

Statement	Frequency	Percentage
Public workers	39	16.3
Health workers	192	80
Private employees	3	1.3
Teachers	3	1.3
Students	3	1.3
Total	240	100

The feedback in table 6 shows that 80% of the participants believe that health workers should be vaccinated first. Those who believe that public workers should be vaccinated first got 16.3% support from the participants. Participants supported private employees, instructors, and students with a total of 3.9% (1.3% each).

4. Discussion

The COVID-19 vaccine's availability and efficacy are critical for effectively managing the pandemic. Policymakers and the government healthcare fitness system must ensure recognition and agreement from both the network and healthcare professionals because hesitation and postponement can lead to vaccine refusal. This can result in disastrous consequences for public health and limit the healthcare system's capacity to deal with the pandemic's demanding settings. The study provided a high-level view of network belief on COVID-19 vaccinations within the cross-sectional study in Mogadishu, Somalia.

The researcher discovered a sufficient level of knowledge, attitude, and belief regarding COVID-19 immunisation. Approximately 97 (40.8%) of people believe that the newly determined COVID-19 vaccination is safe. This was determined by the fact that the majority of the 92 respondents (38.5%) agreed that the COVID-19 vaccine is vital for us, but the researcher did not identify a statistically significant difference between the general public, clinical students clinical doctors, and paramedics.

In line with the researcher's findings, the majority of respondents, 76 (32.2%), believe that it is not possible to reduce the prevalence of COVID-19 without vaccination, and the majority of respondents, 83 (34.9%), believe that the COVID-19 vaccine should be given to everyone. The study indicated that 50% of respondents believe the recently developed COVID-19 vaccination may have side effects. The research also identified that 35% of respondents are unsure whether everyone in society is taking preventive steps.

The study found that the COVID-19 pandemic can be eliminated without vaccination. 67.6% of respondents agree that the vaccine should be provided free of charge in Somalia, 55.6% of respondents disagree on the COVID-19 vaccine as a cause of infertility, while 47% were not sure if COVID-19 vac-

cines will cause a blood clot.

The study also showed that 80% of the respondents were in favour of health workers being vaccinated first, while 16.3% expected the public workers to get vaccinated first.

5. Conclusion

A cross-sectional study in Mogadishu, Somalia, during the ongoing pandemic illustrates community perceptions of COVID-19 immunisation. According to the findings, the current study was able to give a comprehensive analysis of community perceptions of COVID-19 immunisation. Somalis have an adequate degree of knowledge and awareness of COVID-19 and are generally optimistic about eradicating the pandemic.

It's critical to enhance public awareness of the COVID-19 vaccination, address public concerns that could help with disease control, and increase COVID-19 vaccination efforts in developing nations like Somalia and others across Africa.

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DETERMINANTS OF TIMELY INITIATION OF COMPLEMENTARY FEEDING AMONG MOTHERS WITH CHILDREN AGES 6 to 24 MONTHS AT BANADIR HOSPITAL IN WADAJIR DISTRICT, SOMALIA
Mohamed Abdisalam Dahir, Zakariye Ahmed Jama

ABSTRACT

Inadequate and inappropriate complementary feeding contribute to excess morbidity and mortality in young children living in low-income households. Before the age of six months, the early or late introduction of complementary feeds can cause displacement of breast milk and an increased risk of infections such as diarrhoea, which contributes to weight loss and malnutrition. As a result, the objective of this study is to identify the determinants that influence the timely initiation of complementary feeding among mothers with children aged 6 to 24 months who visit Banadir hospital.

A descriptive cross-sectional study was conducted in Banadir hospital. The study was conducted on 92 mothers and caregivers with young children aged six months to 2 years, using a non-probability convenient sampling method and a questionnaire to collect data. SPSS statistical software version 20 was used to conduct the analysis.

97.8% of the participants had a normal delivery during childbirth, while 2.2% of the participants had a cesarian section (C-section). The majority of those who took part in the study had regular deliveries. The researchers recommend that all visitors, mothers, and parents to MCHs and other antenatal care (ANC) service centres be counselled on infant and young child feeding practices in order to increase their awareness of feeding issues.

Keywords: Complementary, Semisolid, Weaning, Determinants, Timely initiation

1. Introduction

The stage of life when meals and liquid milk are fed to newborns and young children in addition to breast milk is referred to as the complementary feeding phase. The non-breast milk food products ingested at this time are referred to as complementary foods (Agedew and Demissie, 2014). Within the first two years of life, the timing of the introduction of nutritionally adequate, safe, and age-appropriate supplemental feeding is critical for the child's optimal growth, development, and health. Despite several interventions aimed at improving infant and young child feeding patterns and nutritional status, acceptable feeding practices remain far below the recommendation (Agedew, 2014).

At six months of age, complementary feeding consists of giving young children extra foods or fluids in addition to breast milk (WHO, 2002). Around the age of 6 months, a baby's energy and micronutrients begin to surpass what breast milk can provide. They are formatively prepared to start eating more (reciprocal) food, which is necessary to meet their increased energy and nutritional requirements (WHO, 2010). In addition, the transition period of 6 months to 2 years is a critical window of opportunity to enhance the survival and optimal growth of the child (Khanal, 2011).

Poor complementary feeding practices mean that many children continue to be vulnerable to irreversible outcomes of stunting, poor cognitive development, and a significantly increased risk of infectious diseases such as gastroenteritis, diarrhoea, and acute respiratory infections (Shumey, Demissie, and Berhane, 2013). Undernutrition results in 3 million child deaths annually, accounting for 45% of all causes of mortality (Shumey, Demissie, and Berhane, 2013). Over two-thirds of these deaths are often correlated with inappropriate feeding practices and occur within the first year of life (WHO and UNICEF, 2003).

The World Health Organization (WHO) has highlighted the characteristics of complementary feeding to include a timely introduction, availability, sufficiency, and security. According to the WHO, supplementary feeding should begin at the age of 6 months, with the frequency of non-milk feeding gradually increasing until the child reaches the age of 24 months. It is critical to understand which aspect of complementary feeding is most essential in the development of malnutrition in children. Global complementary feed-

ing practice has been suboptimal (Ogunlesi et al., 2014).

The rate of timely initiation of complementary feeding in South Asian countries is as per the WHO recommendation for lifelong practice (80% - 94%). In this regard, about 71%, 70%, 55%, and 39% of newborns in Bangladesh, Nepal, India, and Pakistan, respectively, are reported to have had timely initiation of complementary feeding (Shumey, Demissie, and Berhane, 2013).

2. General Objective

The general objective of the study is to identify determinants that influence the timely initiation of complementary feeding among mothers with children aged 6 to 24 months who frequent Banadir hospital in Wadajir district, Somalia.

Specific objectives

1. To determine socio-demographic factors that influence the timely initiation of complementary feeding in children aged 6 to 24 months who attend Banadir hospital in Wadajir district, Somalia.
2. To identify the physiological parameters that influence the timely initiation of complementary feeding among children aged 6 to 24 months who attend Banadir hospital in Wadajir district, Somalia.
3. To evaluate the parental factors that influence the timely initiation of complementary feeding among children aged 6 to 24 months who attend Banadir hospital in Wadajir district, Somalia.

3. Methods and Materials

3.1 Research design

This study was descriptive in design because it was intended to describe the determinants of the timely initiation of complementary feeding among children aged 6 to 24 months who attended Banadir hospital in Wadajir district, Somalia. The study was also designed in a cross-sectional manner because the research data was collected in one location. The study was also quantitative in design, which enabled the researchers to obtain the numeric value of specific characteristics.

3.2 Study area

Banadir Hospital is a public multidisciplinary facility located at the centre of Mogadishu along Banadir Street. Banadir hospital offers a vast range of maternal and pediatric medical services in order to serve the population

within its reach adequately.

3.3 Research population

Mothers and caregivers with children aged between 6 to 24 months will be the target population of this study.

3.4 Sample size

Mothers and caregivers with children aged between 6 and 24 months who are willing to participate in this study during the data collection period.

3.5 Sampling procedure

In order to determine sample size, the Slovenes formula is the most suitable method for determining sample size. After calculating, we got 92 participants for the sample size.

3.6 Research instruments

In order to acquire research data from the target demographic, a questionnaire was used as a data collection tool.

3.7 Validity and Reliability

Validity refers to the relevance of the research instruments to the objective of this study. To establish validity, the questionnaire will be presented to five experts who will rate the relevance of the questions. The content validity of the questionnaire will then be calculated in order for it to be accepted as legitimate.

On the other hand, reliability refers to the respondents' consistency when answering the questionnaire questions. In other words, the instrument can only be reliable if it produces the same results whenever it is repeatedly used to measure the same phenomena with the same participants by other researchers. Reliability was measured using test-retest and stability reliability. Therefore, reliability is the extent to which the same individuals' scores on the same test are consistent over time.

3.8 Data gathering procedures

The significant data collection instrument used in this study was primary data, which included a questionnaire and data as study documents. During data collection, the selection of these instruments was guided by the data requirements and the objectives of the study questionnaire. The researchers were determined to gather reliable and valid data.

Data were analysed using the statistical package for social science (SPSS)

3.9 Data analysis

version 20. A descriptive analysis was conducted, and the results were presented using frequency tables and charts.

3.10 Ethical considerations

Respect: The researchers respected respondents' privacy when entering their private sphere and asking questions.

Confidentiality: The researchers guaranteed maximum confidentiality to the participants. Their information will only be used for the purpose of the study.

Freedom to participate: Participants were informed that they were free to participate. They were also informed that they had the right to withdraw from the research.

Informed consent: Consent was secured from the participants after fully informing them of the nature, potential risks, and benefits of the study.

4 Result

Table 4.1 Determinants Socio-demographic fac

Child's age (month)	Frequency	Percent
6-10	32	34.8
11-15	37	40.2
16-20	14	15.2
21-24	9	9.8
Total	92	100
Age of the mothers and caregivers		
18-27 years old	45	48.9
28-37 years old	45	48.9
38-47 years old	2	2.2
Total	92	100

Child's gender		
Male	53	57.6
Female	39	42.4
Total	92	100
Educational level of the mothers and caregivers		
Primary education		
Secondary education	17	18.5
No formal education	2	2.2
	73	79.3
Total	92	100
Occupation of the mothers and caregivers		
Employed	12	13
Unemployed	80	87
Total	92	100
Marital status of the mother and caregivers		
Married	78	84.8
Divorced/separated/widowed	14	15.2
Total	92	100

As shown in Table 4.1 above, 37 (40.2%) children were between 11 and 15 months, followed by 32 (34.8%) children who were between 6 and 10 months. Children between the ages of 16 and 20 months were 14 (15.2%), and 9 (9.8%) children were between 21 and 24 months.

45 (48.9%) mothers and caregivers were between 18 and 27 years old. Interesting enough, a similar number of 45 mothers and caregivers were between 28 and 37 years old. Only 2 (2.2%) participants were between 38 and 47 years old. The gender of the children was 53 (57.6%) male and 39 (42.4%) female.

The majority of the respondents, 73 (79.3%), had no formal education, while 17 (18.5%) had primary level education, and 2 (2.2%) had attained a secondary level of education. 80 (87%) participants were unemployed, 12 (13%) were employed, while 78 (84.8%) were married, and 14 (15.2%) were divorced.

Table 4.2 Determinants of Physiological factors

Mode of childbirth	Frequency	Percent
Normal delivery	90	97.8
C-section	2	2.2
Total	92	100
Postnatal care is a contributing factor to the timely initiation of complementary feeding		
Strongly disagree	11	12
Disagree	18	19.6
Neutral	3	3.3
Agree	47	51.1
Strongly agree	13	14.1
Total	92	100

Breast problems play a significant influence on the timely initiation of complementary feeding

Strongly disagree	8	8.7
Disagree	18	19.6
Neutral	4	4.3
Agree	52	56.5
Strongly agree	10	10.9
Total	92	100
Over letdown has not played any role in the timely initiation of complementary feeding		
Strongly disagree	16	17.4
Disagree	36	39.1
Neutral	8	8.7
Agree	24	26.1
Strongly agree	8	8.7
Total	92	100

To rate the determinants of physiological factors in table 4.2, the Likert scale was used to measure the level of agreement from strongly disagree to strongly agree.

Table 4.2 shows that 90 (97.8%) of the participants had normal childbirth, whereas the remaining 2 (2.2%) had C-sections.

47 (51.1%) participants agreed that postnatal care is a contributing factor to the timely initiation of complementary feeding. 18 (19.6%) participants disagreed, 13 (14.1%) strongly agreed, 11 (12%) strongly disagreed, and 3 (3.3%) were neutral.

A total of 52 (56.5%) participants agreed that breast problems have a substantial impact on the timely initiation of complementary feeding. 18 (19.6%) of them disagreed, 10 (10.9%) strongly agreed, 8 (8.7%) strongly disagreed, and 4 (4.3%) were neutral in their responses.

36 (39.1%) responders disagreed that over letdown had not played any role in the timely initiation of complementary feeding. 24 (26.1%) of the participants were in agreement, whereas 16 (17.4%) strongly disagreed. 8 (8.7%) strongly agreed, while the remaining 8 (8.7%) were neutral in their responses.

Table 4.3 Determinants of parental factors

Antenatal care visit	Frequency	Percent
Yes	72	78.3
No	20	21.7
Total	92	100
If you answered “yes,” how many times have you visited?		
1-3 times	49	53.3
4-5 times	19	20.7
6 and more times	4	4.3
Non	20	21.7
Total	92	100
Maternal frequency of feeding per day		
1-2 times	36	39.1
3-4 times	50	54.3
5 and more times	6	6.5
Total	92	100
Place of delivery		
Health facility	62	67.4
Home	30	32.6
Total	92	100
Type of first weaning food		
Cow milk	9	9.8
Potatoes	21	22.8
Powder milk	22	23.9
Other	40	43.5
Total	92	100
Do you visit postnatal care?		
Yes	65	70.7
No	27	29.3

Total	92	100
How many times have you visited a postnatal care clinic?		
One time visit	12	13
Two time visits	17	18.5
Three time visits	23	25
Four time visits	13	14.1
Non	27	29.3
Total	92	100

The data in table 4.3 above shows that the majority of respondents, 72 (78.3%), believed that antenatal care had an effect on the initiation of complementary feeding, whereas only 20 (21.7%) believed that there was no effect.

Those who visited the antenatal care clinic between 1 and 3 times were 49 (53.3%) respondents. 20 (21.7%) of the respondents were not visitors to the antenatal care clinic. Those who visited 4 to 5 times were 19 (20.7%), and 4 (4.3%) had visited six or more times.

50 (54.3%) of the participants stated that their maternal frequency of feeding per day was between 3 and 4 times. 36 (39.1%) of them did it once or twice per day, and 6 (6.5%) participants' maternal feeding frequency was five or more times per day.

62 (67.4%) of the respondents gave birth at a health facility, and 30 (32.6%) gave birth at home.

Other forms of weaning food that was not specified in the questionnaire were chosen by 40 (43.5%) participants. Powder milk was the first weaning food according to the 22 (23.9%) participants. 21 (22.8%) participants stated that potatoes were the first weaning food, while 9 (9.8%) had cow milk as the first weaning food.

65 (70.7%) participants reported that they had gone for postnatal care, whereas 27 (29.3%) had not yet gone.

Out of the 65 participants who had gone for postnatal care, 23 (25%) had visited postnatal care three times. 17 (18.5%) had gone twice, those who had visited four times were 13 (14.1%), and 12 (13%) had visited only once.

5 DISCUSSION AND RECOMMENDATION

5.1 Discussion

Using several variables, this study investigated the determinants influencing the timely initiation of complementary feeding among mothers with children aged 6 to 24 months. According to the data analysis, the educational level of the mothers is a contributing factor that impacts the initiation of complementary feeding. The inappropriate introduction of supplemental feeding by illiterate mothers will cause their children to complain.

In this study, postnatal care visits determined that higher postnatal visits, as well as antenatal attendance, were positively associated with the infant's prompt introduction of complementary feeding. The frequency with which mothers visit antenatal care is also important because it greatly supports the timely initiation of complementary feeding. The more mothers visit antenatal care, the more they get information related to complementary feeding. Also noted is that over letdown has not played any role in the initiation of complementary feeding as the more the mother's production, the more timely initiation starts because this is related to her knowledge.

This study shows that the type of food initiated first for the infants as complementary feeding food varied and depended upon what they could get or afford to buy. The researchers received the most feedback from participants who had children aged 11 to 15 months. They played a big role in analysing the data collected and summarising the results.

The results with higher rankings were as follows: 37 (40.2%) children were between 11 and 15 months. A total of 90 (97.8%) mothers and caregivers were between 18 and 37 years old, and the gender of male children was 53 (57.6%). The majority of the respondents, 73 (79.3%), had no formal education, and 80 (87%) of the participants were unemployed. 78 (84.8%) were married, and 90 (97.8%) of the participants had normal childbirth.

47 (51.1%) participants agreed that postnatal care is a contributing factor to the timely initiation of complementary feeding. A total of 52 (56.5%) participants agreed that breast problems have a substantial impact on the timely initiation of complementary feeding. 36 (39.1%) responders disagreed that over letdown had not played any role in the timely initiation of complementary feeding. 72 (78.3%) participants believed that antenatal care had an effect on the initiation of complementary feeding. Other forms of weaning

food that was not specified in the questionnaire were chosen by 40 (43.5%) participants, and 27 (29.3%) of the participants mentioned that they had not visited the postnatal care clinics.

5.2 Conclusion

The main objective of the study is to identify determinants influencing the timely initiation of complementary feeding among mothers with children aged 6 to 24 months. The research specifically focused on determining socio-demographic factors, identifying physiological factors, and parental factors influencing the timely initiation of complementary feeding among children aged 6 to 24 months. As a result, the evidence in this study reveals that level of education, occupation, mother's age, style of delivery, breast problems, excessive letdown, antenatal care visits, venue of delivery, and postnatal care are all factors to consider.

According to the study's results, as summarised by some of the participants' feedback, the majority of them had an informal educational level. This component, which reduces the optimal commencement of complementary feeding, can be empowered with important health information. This underlines the importance of improving information, education, and communication (IEC) systems and procedures.

45 (48.9%) of the participants were between the ages of 18 and 27. Similarly, 45 (48.9%) of the same group were between the ages of 28 and 37. The majority of the respondents, 47 (51.1 %), agreed that postnatal care is a contributing factor to the timely initiation of complementary feeding. The majority of the respondents, 52 (56.5%), agreed that breast problems play a significant influence on the timely initiation of complementary feeding.

5.3. Recommendations

Depending on the finding of this paper, the principal study recommends the following: -

1. Health professionals should focus on providing advice and counseling sessions to mothers and caregivers on the timely initiation of complementary feeding during prenatal, delivery, and postnatal periods.
2. Special emphasis should be given to mothers with low educational status, including those over 30 years of age, by giving them continue health

education to change their wrong attitudes and perception.

3. Creating motivators for mothers, such as a prize in the media for those who begin complementary feeding at six months, to create awareness and promote the timely initiation of complementary feeding.

4. In government institutions, establishing a baby centre is an alternative solution to improve the timely initiation of complementary feeding for government employees.

Furthermore, additional research should be conducted using a qualitative study design to deeply understand socio-cultural and behavioural factors related to complementary feeding in order to develop and implement a better complementary feeding strategy.

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Defaulters of Tuberculosis Treatment Among Multidrug-Resistance (MDR-TB) Patients at Lazaretto Forlanini Hospital in Mogadishu, Somalia

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ABSTRACT

Tuberculosis (TB) is a global public health issue, and it's one of the oldest diseases known to affect humans, which remains one of the highest leading of mortality worldwide. The primary purpose of this study is to identify the factors that cause non-adherence to TB treatment (defaulters) among TB patients at Lazaretto Forlanini Hospital in Mogadishu, Somalia.

METHODOLOGY

A descriptive cross-sectional hospital-based study was conducted among patients who had not adhered to their medication at TBMs Lazaretto Forlanini Hospital in Mogadishu, Somalia, from March to May 2019. The defaulters were a total of 103 respondents during the study period. A non-probability convenient sampling method was applied in this research.

DATA COLLECTION

Data was collected by using a structured questionnaire. The statistical software for social science (SPSS) version 20 was used to analyse descriptive statistics. Tables, figures, and graphs were used to describe the data.

RESULTS

This study sheds light on the defaulters of tuberculosis treatment among TB patients, and it shows that 79.6% of the male population are among those who fail to complete the TB course of treatment. Women, at 20.4%, had a much lower percentage of defaulting TB treatment than men.

In terms of education, those who have never attended school and those at the secondary school are least likely to default on the medication, with 12.6% each, followed by those at the postgraduate level at 16.5%, and 19.4% by those at the university level. The most likely patients who can default on TB medication are those in primary education level, with a rate of 38.8%.

The percentage of people who fail to take their TB treatment differs somewhat between the unemployed at 32% and the employed at 30.1%. Employers have a rate of 21.4% of TB medical treatment defaults, followed by mothers who are housewives at 16.5%.

CONCLUSION

The study concluded and recommended that there is an urgent need for continuous and effective health education for the patients and their families, in addition to social support when starting the medications, to ensure adherence and compliance with the anti-tuberculosis drug, as well as regular monitoring, counselling, follow-up with the patients, easy access to health care centres, and access to the TB drugs.

Keywords: Tuberculosis, Adherence, Tuberculosis Treatment, Non-adherence, Defaulters

1. BACKGROUND

Tuberculosis (TB) is a contagious disease caused by the bacteria *Mycobacterium tuberculosis*. It does affect not only the lungs but also other parts of the body (extrapulmonary). The condition usually has cardinal features such as persistent cough with or without sputum, fever, loss of appetite, loss of weight, chest pain, and haemoptysis. It can be transmitted through the air when a patient discharges the bacteria through coughing and sneezing. However, the probability of getting this disease is much higher when the patient is also infected with the human immunodeficiency virus (HIV) [1]. Tuberculosis (TB) is a global public health issue. It infects millions of people each year and is the second leading cause of death globally, after the human immunodeficiency virus (HIV) [2]. In 2015, 10.4 million people contracted TB, and 108 million died from it, including 0.4 million HIV-positive patients. Over 95% of TB mortality occurs in low and middle-income countries [3].

In 2015, about 480,000 people globally developed multidrug-resistant tuberculosis (MDR-TB). Since 2000, TB incidence has decreased by an average of 1.5 per cent per year, implying that additional acceleration is required to meet the 2020 goal of the “End TB Strategy” [3]. In Somalia, TB is a serious social killer disease. It’s estimated that in 2013, more than 13,000 new cases were detected, one every 40 minutes. This clearly showed the recent rise in the number of TB cases in Somalia [4]. The representative of the World

Health Organization (WHO) in Somalia stated that resistance to anti-TB drugs is considered an emerging concern in the country. That means Somalia has the highest prevalence of MDR-TB in East Africa. This result is due to the failure of governance and leadership since the collapse of the Somalia government regime in 1990, especially in the health care system [4].

2. GENERAL OBJECTIVE

The main purpose of this study was to assess the factors that influence non-adherence TB treatment (defaulters) among TB patients at Lazaretto Forlanini Hospital in Mogadishu, Somalia.

Specific objectives

1. To determine the socio-demographic characteristics of tuberculosis patients at Lazaretto Forlanini Hospital in Mogadishu, Somalia.
2. To assess the patient's awareness of the importance of TB treatment at Lazaretto Forlanini Hospital in Mogadishu, Somalia.
3. To identify the main risk factors associated with non-adherence to TB treatment at Lazaretto Forlanini Hospital in Mogadishu, Somalia.
4. To evaluate the capacity of the medical centre to counsel, monitor, and manage non-adherence to treatment among TB patients at Lazaretto Forlanini Hospital in Mogadishu, Somalia.

3. METHODS AND MATERIALS

3.1 Study design

A descriptive cross-sectional hospital-based study was conducted to assess factors related to non-adherence to TB treatment among MDR-patients at Lazaretto Forlanini Hospital in Mogadishu, Somalia.

3.2 Study population

The study population in this research were patients with multidrug-resistant tuberculosis at Lazaretto Forlanini Hospital who had interrupted their medication.

3.3 Study Area

This research was undertaken at Lazaretto Forlanini Hospital in the Benadir region of Somalia's Abdi Aziz district, north of Mogadishu, Somalia. It was once the most prominent and only mental hospital in Mogadishu. Still, it was recently converted to an MDR-TB medical centre, and it now serves a

vital role in the community.

3.4 Sampling techniques

A convenience non-probability sampling method was used, with a sample size of 103 defaulter patients who filled in the questionnaire. The data was collected between February and May 2019, including those who interrupted their medication.

3.5 Data collection methods

A face-to-face interview was conducted using a semi-structured questionnaire based on independent variables. The research questionnaire structure used in this study was developed and consisted of four parts for the patients to fill in. The four parts are as follows:

Part 1: There were nine items based on the general characteristics of the respondents, including gender, educational status, type of occupation, level of income per month, marital status, number of rooms in the house, number of people per room, and place of residence.

Part 2: It included the patients' knowledge of the mode of TB transmission, consequences of interrupting treatment, the importance of treatment, types of drugs and their side effects, the duration of non-adherence, and factors that caused the patient's delay in seeking treatment.

Part3: The main risk factors associated with non-adherence to treatment according to their emotions, work, and social, perceptions towards TB drugs, economic barriers and health centre.

Part 4: Assessment of the health centre's role at Lazaretto Forlanini hospital in cases of patient non-adherence, including counselling, monitoring, and contacting the missed patient, as well as drug availability.

3.6 Data analysis

The data collected was compiled and analysed using the statistical package for social science (SPSS) version 20.

3.7 Ethical considerations

The researcher explained the purpose and benefits of the study to the participants and asked for their permission to answer the questions. Participation in the study was voluntary, and participants were not compelled to take part in the study. Even those who initially accepted to participate were free to withdraw during the study if they did not wish to continue.

4. RESULTS

Table 4.1 Gender of patients

Gender of patients	Frequency	Percentage
Male	82	79.6%
Female	21	20.4%
Total	103	100%

Table 4.1 illustrated the gender of the respondents, and it revealed that 79.6% of the respondents were male, and 20.4% were female.

Table 4.2 Socio-demographic characteristics and TB the treatment default frequency of the patients

Educational Level	Frequency	Percentage
Illiterate	13	12.6%
Primary school	40	38.8%
Secondary school	13	12.6%
University undergraduate	20	19.4%
University Post graduate	17	16.5%
Total	103	100%
Type of occupation of the patient		
Housewife	17	16.5%
Employee	31	30.1%
Employer	22	21.4%
Not employed	33	32%
Total	103	100%
Income per month		
Low	71	68.9%
Medium	31	30.1%
High	1	1%
Total	103	100%

Marital Status		
Married	57	55.3%
Not Married	44	42.9%
Divorced	2	1.9%
Total	103	100%
Number of rooms in the house		
One	19	18.4%
Two	36	35%
Three	48	46.6%
Total	103	100%
Number of people per room		
One	6	5.8%
Two	40	38.8%
Three	33	32.0%
Four	9	8.7%
More than four	15	14.6%
Total	103	100%
Place of residence		
Urban	58	56.3%
Rural	45	43.7%
Total	103	100%

Table 4.2 shows the socio-demographic characteristics of the patients, as well as their TB treatment default frequency, based on their education level, occupation, monthly income, marital status, size of their houses, and area of residence.

According to the feedback received from the participants, those with a high rate of TB treatment defaulters were 38.8% with primary education, 32% were unemployed, 68.9% had low income, 55.3% were married, 46.6% lived in 3-roomed houses, 38.8% with two people sharing a room, and 56.3% lived in urban areas.

On the other hand, feedback that had low rates of TB treatment defaulters was composed of 12.6% illiterates, 12.6% had secondary education, 16.5% were housewives, 1% had a high income, 1.9% were divorced, 18.4% lived in a 1-room house, 5.8% had their own rooms, and 43.7% lived in rural areas.

Table 4.3 Knowledge of the patients towards the mode of the TB spread

Knowledge about that TB treatment is important	Frequency	Percentage
Yes	98	95.1%
No	5	4.9%
Total	103	100%
Knowledge that TB can is treatable		
Yes	96	93.2%
No	7	6.8%
Total	103	100%
Knowledge about the consequences of interrupting TB treatment		
Yes	86	83.5%
No	17	16.5%
Total	103	100%

Knowledge about types of TB treatment		
Yes	63	61.2%
No	40	38.8%
Total	103	100%
Knowledge about the side effects of TB treatment		
Yes	56	54.4%
No	47	45.6%
Total	103	100%
Knowledge about the drugs that were interrupted will restart		
Yes	78	75.7%
No	25	24.3%
Total	103	100%
Knowledge about DOT (directly observed treatment)		
Yes	59	57.3%
No	44	42.7%

Table 4.3 indicates patients' understanding of the relevance of treatment, and it reveals that 95.1% of the respondents are aware of the importance of TB treatment, whereas 4.9% are unaware. 93.2% are aware that tuberculosis is treatable. However, 6.8% are not. 83.5% are aware of the repercussions of treatment discontinuation, whereas 16.5% are not.

61.2% knew about the different types of TB treatment, while 38.8% didn't. 54.4% were aware of the side effects of TB treatment, while 45.6% were unaware. 75.7% know that if taking the drugs is interrupted, they will have to restart the whole process again. Unfortunately, 24.3% did not know this. 57.3% knew about DOT (directly observed treatment), while 42.7% did not know.

Figure 4.1 Psychological and emotional factors related to non-adherence of TB patients

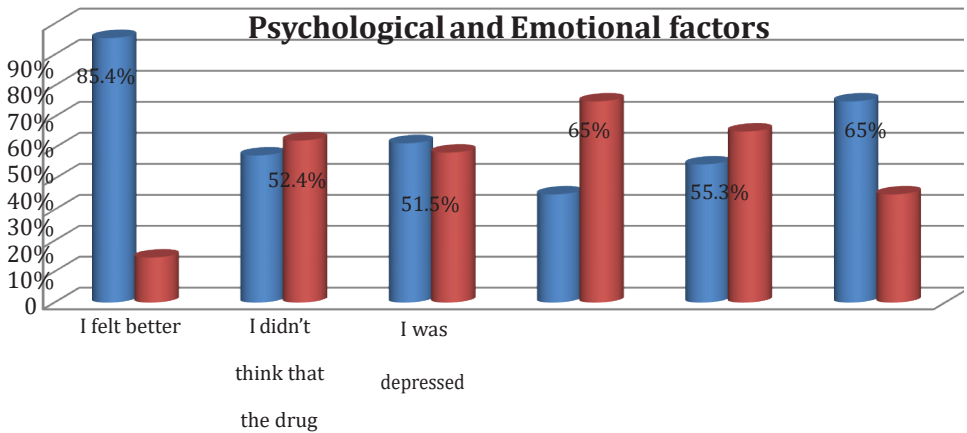


Figure 4.1 illustrates emotional feelings as a factor associated with non-adherence to treatment, and it reveals that 85.4% of the respondents felt better, while 14.6% did not. 52.4% thought that the drug was important, while 47.6% did not think it was important. 51.5% of the participants were depressed, while the remaining 48.5% were not. 65% believed that they have TB, while 35% didn't believe they had it. 55.3% were not addicted to alcohol, whereas 44.7% were addicted to too much alcohol. 65% got tired of swallowing the drug daily, while 35% did not take the drug daily.

Figure 4.2 Social factors related to non-adherence of TB drugs

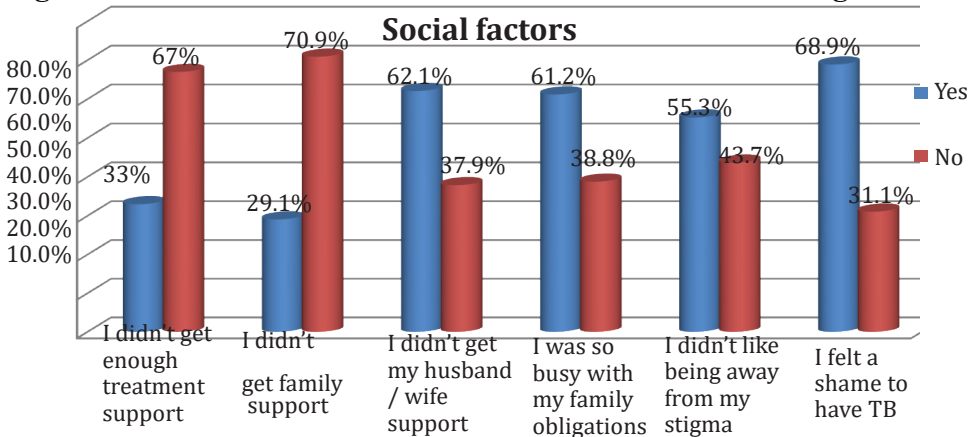


Figure 4.2 illustrated the social part as a factor associated with non-adherence to treatment, and it revealed that 67% of the respondents did not get enough treatment support, while 33% did not get enough treatment support. 70.9% didn't get family support, while 29.1% said they didn't get family support. 61.2% were so busy with family obligations, while 38.8% were not so busy with family obligations. 55.3% didn't like to be away from their families, while 43.7% said no, and 68.9% felt a shame to have TB stigma, while 31.1% said no, felt a shame to have TB stigma.

Figure 4.3 Health Center as a factor for non-adherence TB medication

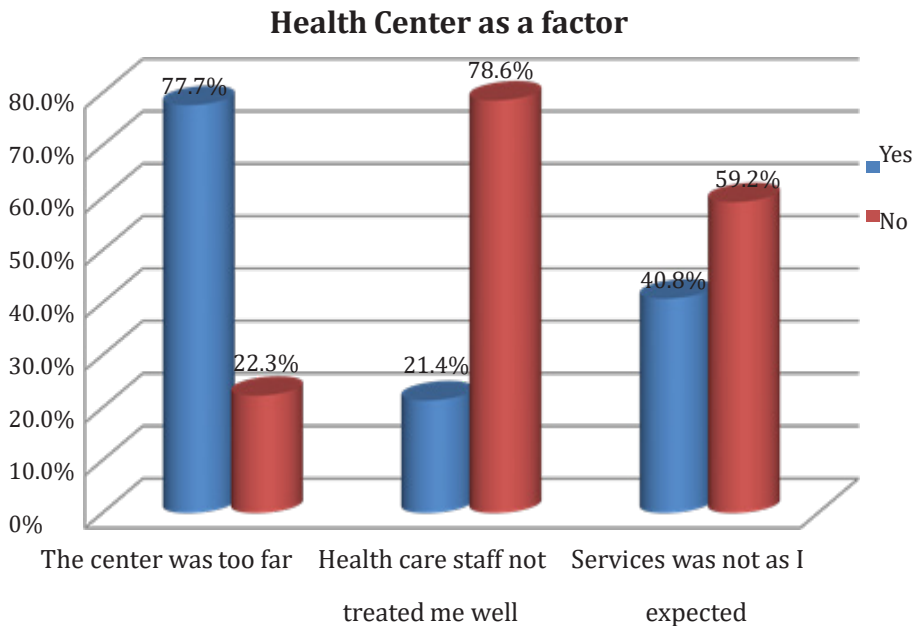


Figure 4.3 depicts the health centre factors associated with non-adherence to treatment, revealing that 77% of the respondents felt the centre was too far, while 22.3% stated it was not far. 78.6% said that healthcare staff treated them well, compared to 21.4% who reported that healthcare staff did not treat them well. 59.2% mentioned that the services were as expected, while 40.8% said that services were not as expected

5. DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

This study was conducted to assess factors related to non-adherence to TB treatment among patients at Lazaretto Forlanini Hospital in Mogadishu, Somalia. The patients came from different socio-demographic backgrounds. Patients' psychological, emotional, occupational, and economic perceptions of the medication are thought to be essential factors in non-adherence to TB medication.

The majority of patients, 79.6%, were male, whereas 20.4% were female, as indicated in table 4.1. A study conducted in India (Balasubramanian et al., 2000) [5] found that being male and employed implied twice the risk of abandoning treatment, mainly because male workers have trouble leaving their duties for a visit to the health care centre. Another study conducted (Holtz et al., 2006) [6] in Pretoria, South Africa, from 1991 to 2001 found that majority of defaulters were male. The higher rate of defaulters among men compared to women can be assumed to be related to their role as breadwinners of the family. Men tend to leave their homes quite early for work to provide for their families, making it difficult for them to regularly visit the healthcare facility, especially during the intensive phase of treatment. Also noted was that the majority of patients were between the ages of 20 and 30. As shown in Table 4.2, the educational level of the patients and their awareness can help reduce disease transmission. The majority of the patients have achieved an educational level of primary school (38.8%), and 19.4% were university level and 12.6% illiterate. Still, Mohamed et al. (2015) [7] mentioned that the majority of the patients had an educational level of illiterate (43.5 %).

According to table 4.3, 61.2% of patients believe that coughing can spread TB. Croft and Croft (1999) [8] conducted a study in Bangladesh, and 44% of the participants in that study were aware that cough was a symptom of TB. 95.1% of respondents understand the importance of treatment, and 96% understand that TB is treatable, while 83.5% understand the consequences of discontinuing treatment.

61.2% are aware of the various types of TB drugs, and 54.4% are aware of the treatment's side effects. 75.7% know that the medicines interrupted will restart if interrupted, while 57.3% know about DOT (directly observed

treatment), while 42.7% do not know. 75.7% are aware that if treatment is interrupted, they will have to restart all over again. DOT (directly observed treatment) is known to 57.3% of the population, whereas 42.7% are unaware. A study done by Tumbo et al., 2011 [9] in South Africa showed that 40% had never heard of DOT. DOT was mainly used for treatment regimens (87.5%) rather than first-line treatment (48.6%).

In figure 4.1 above, 85.4% of the patients did not adhere to treatment due to psychological and emotional factors like feeling better. 52.4% thought the drug was necessary, and 47.6% didn't. 51.5% were depressed, 44.7% were addicted to alcohol, 65% got tired of swallowing the medicine daily, and 35% did not take the medication daily. Agreeing with the study done by Nomakorinte; 2014 [10] revealed that patient behaviours such as sickness, feeling better, nurses' attitudes, work issues, and temporary change of residence were reasons why patients stopped taking their treatment.

The main reason given in this study was that people default on their medication because they feel better. Nomakorinte also agreed upon this; 2014 [10] stated that people do not adhere to their medication because they feel better. They assume that when a person feels better, they do not continue taking their medication because they believe they have recovered from the sickness. Dodor and Afenyandu (2008) [11] conducted another study at the Effia-Nkwanta Regional Hospital in Ghana, looking at factors linked to tuberculosis treatment failure and completion. They found that patients were tempted to stop therapy once their symptoms had diminished.

Figure 4.2 also depicts social factors related to non-adherence treatment. 67% of the participants do not receive adequate treatment assistance, and 61.2% are overburdened with family obligations. 55.3% resent being away from family for an extended period, and 68.9% are ashamed of their TB stigma.

Patient perceptions of TB treatment as a reason for non-adherence with treatment included disliking taking heavy tablets or pills daily and for a long time by 68% of them. 61.2% said the drugs gave them side effects, while 38.8% reported that the medications did not provide them with side effects.

5.2 Conclusion and Recommendation

The study concludes that the total number of non-adherence patients to TB medication was 103 from February to April 2019 and they came from different backgrounds. In this sample, males represent the majority of the patients, and most of them are in the productive age group of 59.2 years, having completed primary education, unemployed, married, and most of the patients living in low economic conditions.

The majority of patients are well-versed in the transmission route of tuberculosis through coughing. Most of them believe that TB is curable and are aware of the consequences of drug interruption. The majority of the patients know DOT, and most of them mentioned that they had been observed at the hospital where they received health education about the importance of compliance with the drug and asked about the side effects of the drug. They were also monitored and counselled at the start of the medication.

Most of the patients started seeking treatment in health care centres like clinics, hospitals, and pharmacies, although some sought treatment through self-treatment and traditional healers. Many patients began their treatment either when they became ill or after being diagnosed for an extended period (more than four weeks). This suggests that the main reasons behind the delay in seeking care are a lack of knowledge about the severity of TB, difficulties in accessing health care centres, and feelings of stigma. Although the majority of patients stated that the medicine is provided free of charge at the centre, psychological, emotional, personal, social, economic, and health-care-related issues and the treatment's perspective were the main reasons why patients did not adhere to the treatment. These are warning signs that tuberculosis is one of the primary infectious diseases. These variables may result in drug resistance, increase disease spread in the community, and make treatment more difficult.

Lastly, this study found that these characteristics were classified as patient-related factors, health provider-patient relationships, patterns of health care delivery in the centre, and socio-cultural factors that threatened tuberculosis treatment adherence.

5.3 Recommendation

According to the above findings, the following are recommended: -

- In this study, the patients urgently need economic, psychological, social, and family support.
- Encourage health education for patients at the beginning of their medication by informing them about the importance of compliance with the drug to prevent multidrug resistance, high transmission of TB in the community, and relapse in patients.
- These health education messages must emphasise issues related to smoking and addiction during treatment periods, relief after starting treatment, being informed of the side effects, and not feeling stigma from their friends and relatives.
- Increase the number of DOT centres in other parts of the country and remote areas of Mogadishu state to reduce transportation problems or otherwise provide them with transportation.
- Conduct regular counselling and monitoring sessions for the patients, such as follow-up, measuring their weights, and educating them on good nutrition that immediately improves their treatment. They should be monitored for sputum production after two months and by the end of the fourth month and after completing the treatment regimen. The patients' sputum should be re-examined to confirm their healing process and follow-up with DOT centres.
- It should be considered a community's health communication by addressing issues related to TB and DOT through channels like TV, radio, and newspapers.
- Increase the number of health workers in DOT centres by adding more doctors, nurses, and other professionals such as social workers, nutritionists, and psychologists to counsel TB patients by giving them advice, inquiring about side effects of the drugs, the importance of adhering to medication, and seeking funds to build TB clinics, health facilities, and DOT centres.
- Employ community mobilisation and involvement in solving problems related to non-adherence and compliance with the treatment regimen.
- Further studies about the non-adherence of TB treatment, including focus group discussion (FGD) and large samples through qualitative research, are recommended.

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ANALYSIS OF CAUSES OF EXAMINATION MALPRACTICES IN SECONDARY SCHOOLS IN THE BANADIR REGION OF SOMALIA

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ABSTRACT

This research was carried out to investigate examination malpractice among secondary school students in the Banadir region of Somalia. The quality of the examinations administered is critical since it is the crucial aspect that ensures the educational quality of any given education system. Quality education is determined by the whole examination process, including examination settings, printing examination papers, organizing the examination hall, and vigilance in supervision.

The project highlights the causes of examination malpractice among secondary school students, the effects and causes of examination malpractice, and suggests possible solutions to this crisis in secondary schools. A total of 20 teachers and 100 students were interviewed, and questionnaires were used to collect data from four secondary schools in Somalia.

At the end of the analysis, the study revealed various forms of examination malpractices such as students copying from each other, exchanging examination materials, using mobile phones and other electronics, and conniving with teachers during examination time. Examination malpractices were associated with a lack of students' preparation for the examination, inadequate professionalism on the part of the teachers, and a lack of vigilance by the supervisor during examination time.

The research instrument used for the study was the teacher's and student's perception questionnaire, which was validated by the supervisor and utilized for the collection of data from the respondents. The information gathered from the respondents was analyzed using distribution tables and simple percentages. The researcher suggests that this dreadful situation in secondary schools could be reversed if examination guidance and counselling were provided to students termly prior to examinations, and a refresher course on effective examination management was organized for teachers.

Keywords: Examination, Malpractices, Banadir, and Somalia.

1. Introduction

Before Somali independence in 1960, there were three different educational systems: Somali Koranic Schools, Italian Trusteeship, and British Protectorate (Page, 2010). Traditional Somali education involved the informal education of Koranic schools known as Duksis in the south and Ma'amad in the north. These were mobile schools where the teachers and students travelled alongside the nomadic tribes while learning the principles of Islam and the Koran. The informal nature of the education meant that the students would also learn the ways and skills of the tribe they were travelling with. The Koranic lessons were taught in Arabic.

The Italian Trusteeship signed an agreement with the United Nations to provide a free education system that offers elementary, secondary, and vocational education. The language of instruction at all levels was Italian, and enrolment accounted for 0.1% of the population. The British protectorate offered elementary education in 17 government schools where the language of instruction was Arabic. They also established a teacher training school with the assistance of instructors from the East African Army Education Corps. The medium of instruction at all levels above the elementary, intermediate and secondary, was English.

Prior to 1960, the most effective and successful form of education was the Koranic school, since, at that time, colonial attempts were minimal and only affected a small proportion of Somalis. This could be a reflection of the formality and irreverence of western-style education on Somali traditions and ways of life. With the independence of the Republic of Somalia, the government inherited all three educational systems. However, little was done in the following decade to make education more accessible to the Somali people. It was given out through informal systems of communal interaction and was mainly about Islamic studies and traditional crafts (E. M. Anderman & Murdock, 2007). With the arrival of colonial powers in the late 19th century, the formal learning systems began to evolve slowly and steadily. Although these systems were limited in scope and were essentially intended for colonization, they marked the beginning of learning systems that were different from the traditional education systems (Page, 2010). Following independence from Britain in 1960, the education system in Somalia developed considerably, and access to formal education also increased in all the major

towns across the country.

Education turned out to be a priority to the extent that both the civilian and military governments who ruled Somalia in the period between 1960 and 1990 boosted the schooling system by building hundreds of schools and training tens of thousands of teachers, with the establishment of the Somali National University serving as the significant achievement (Aisen & Francisco, 2008). The adoption of the Latin script for writing in the Somali language and the country-wide implementation of literacy programs enhanced the existing learning system and encouraged citizens to learn (Acemoglu, Johnson & Robinson, 2001). After Somalia's state collapsed in 1991, the formal education system that had been steadily growing since the 1960s drastically declined (Federal Research Division Somalia, 2001).

With the collapse of the Somali State, all existing learning systems in the country were destroyed during the civil conflict and the consequent factional wars (Thomas, F. Homer-Dixon, 1991). In the absence of an effective state in the country (International Crisis Group, Somalia, 2007–2008), Somalia remained without any formal education programs until 1995, when Somali teachers started to restructure and rejuvenate the schooling system. During this period, Somalia experienced a poor examination process as almost every school-administered its examination and awarded its certificate (FPEN, 2016). This left a lot of dodges in the educational system, as international standards could not accept such an assessment system.

Despite the establishment of the Somali National Examination Board (SNEB), the quality of secondary education is still ruined with many unanswered questions (MOE 2014). As per the researcher's observation, this can be seen in the low quality of students who have to graduate from these schools with little to no confidence. This could be related to the quality of the examination procedures at the secondary school level. Referring to the Oxford Advanced Learners Dictionary (2000), a well-defined examination is a verbal or practical test at school or college, especially one that is important in order to obtain a qualification. On the other hand, a test or examination is an assessment intended to measure knowledge, skill, aptitude, physical fitness, or classification on various topics for the person taking the test. The examination is a structured evaluation technique in which individuals are presented with a series of questions or tasks geared towards ascertaining the

individual's acquired knowledge and skills (Oduwaiye, 2014).

Examination malpractice is described as any deliberate act of wrongdoing, contrary to the rules of examinations, premeditated to give a candidate an unfair advantage. Examination malpractice, also known as cheating, is the illegal action that students engage in during exams in order to improve their grades by cutting corners. This malpractice is an act or irregular manner of testing candidates which contravenes the rules and conventions guiding the conduct of examinations. Examination misconduct has caused a great deal of harm to students since many of them have neglected their studies in the hope of performing the magic they are used to in every examination. Examination malpractice in Somalia's educational system has been widely discussed and viewed as a significant challenge for examination bodies and school administrators, the entire education system, the government, and society at large.

Examination malpractice, as defined by the West African Examination Council (WAEC) (2003), is any irregular behaviour or actions exhibited by candidates or anybody charged with the responsibility of conducting examinations in or outside the examination hall, before, during, or after such examination, with the aim of taking undue advantage. Many of these irregularities or misconducts revolve around examinations, and they have increased at an alarming rate over the last three decades.

In the Banadir State of Somalia, several cases of examination malpractice have been identified in the last five years as well as the previous national examinations (Gross, 2003). These malpractices include cheating, having prepared answers in the examination halls, unethical use of academic resources, disregard for academic regulations, use of smartphones, verbal and non-verbal communication during examination time, and a few examples (Glasner, 2002 & Ogunwuyi, 2005). If such a situation is not addressed, it will escalate improper examination practices and undermine the credibility of the National Examination Board, both nationally and internationally. In a bid to pledge and protect the integrity of this vital examination board of SNEB, there is a need to evaluate the causes of multi-examination malpractices, identify the various forms of examination misconduct, and come up with possible extenuating solutions to fight these unfriendly examination acts in secondary schools, using Banadir district in Somalia as a case study.

2. METHODS

This study adopted a survey-type of descriptive research design. This involved the collection of information from students and teachers in several secondary schools in analyzing the relationships between variables (Oppenheim, 1992).

The study population was comprised of 100 students and 20 teachers. These respondents were chosen because they had previously attended these schools and had observed how the examination process worked. They could therefore provide the required information pertaining to this study. This study included four secondary schools from different districts in Somalia: Mogadishu International in Hodan district, SYL, Imam Shafie, and Yasin Osman Secondary School. These schools were chosen because they have been in existence for some time and have been involved in the administration of the National Examination. They have many graduated students who have pursued higher levels of learning before the collection of data in these targeted schools.

A pre-test was conducted in one non-targeted secondary school in the neighbouring district. This enabled the researcher to establish the reliability and validity of the data that could be collected. The researcher used various methods in data collection, including interviews, because respondents could give quick feedback, and the researcher could analyze their facial expressions and questionnaires because they allowed the respondents to freely express their opinions and beliefs about the study.

The reliability of the data collected was established by consistently administering the questionnaire and interviews with the selected respondents three consecutive times to the same subjects. The data collected was analyzed using the computer program Statistical Packages for Social Sciences (SPSS), whereby it was converted into percentage form and summarized in tables for straightforward interpretation.

3. RESULTS

The study assessed the causes of examination malpractice in secondary schools in the Banadir region of Somalia, taking some selected secondary schools from different districts as the case study. The researcher used interviews and questionnaires in the collection of data. The data collected was converted into percentages for easy presentation and interpretation, and it was then represented in the table form as per each research objective.

Table 1. Forms of Examination Malpractices in the Secondary Schools in Banadir Region

Insertion	Agree%	Disagree%	Total %
Bringing prepared answers to examination halls.	80	20	100
Copying other students' work during examinations.	90	10	100
Copying answers directly from units or textbooks during examinations.	78	12	100
Invigilators conniving with students to cheat in examination halls.	75	25	100
Use of mobile phones and other electronic devices.	97.3	2.7	100
Copying from one another/ exchanging questions/answers sheets.	88	22	100
Total	508.3	191.7	700

The results in Table 1 above indicate that various forms of examination malpractice exist in selected secondary schools in Somalia, including concealed and unconcealed ones. The findings show that 80% of the respondents agreed that students carry prepared answers into the examination hall, while 20% opposed it. This implies that form practice is at its highest peak, beyond which any examination standard cannot be valid. It was also found out that copying from other students is common, as 90% of the respondents agreed on this and 10% disagreed.

There is also a lack of vigilance in the supervision exercise during examination time. Findings indicate that 75% of the students planned with the invigilators to cheat on the examination, while 25% opposed it. This suggests a lack of inadequacy of professional skills amongst teachers in these schools. The use of mobile phones and other electronic devices was found to be common practice as 97.3% of the respondents supported this view, while only 2.7% rejected it. This implies that mobile phones are carried into the examination hall, especially smartphones, which the learner can easily use to find answers to exam questions. It was found that 88% of the respondents agreed with students exchanging materials during the exams, which shows that it is considered standard practise by the students in these schools.

Table 2. Causes of Examination Malpractice in some selected schools in Banadir

Insertion	Agree %	Disagree %	Total %
Students' indiscipline in the examination.	92	8	100
Ineffective supervision of students during examinations.	96	4	100
Insufficient preparation for the examinations among many students.	94	6	100
Desirability to pass examinations.	88	12	100
Ineffectiveness in administering punishment for examination malpractice culprits.	88	12	100
Ineffectiveness in continuous assessment.	80	20	100
Total	538	62	600

The results in Table 2 indicate that there are various causes of examination malpractices. Students' indiscipline, insufficient preparation for the examination, and ineffective student supervision during the examination were found to be amongst the most outstanding causes of examination malpractices in these secondary schools in the Banadir region. The finding indicated that 92%, 94%, and 96%, respectively, agreed on students' indiscipline, insufficient examination malpractices, and ineffectiveness in the supervision role during examination time. Only a small percentage of 8%, 6%, and 4% disagreed with each mentioned perspective. This is an indication of the loophole in the examination system, both at the student and teacher levels. The result also indicated that 88% of the students had the desire to pass the examination by all means, while 12% opposed this view. It shows that students only want to pass the examination without doing the necessary work for grades and cannot defend the results in future careers. The findings further indicated that ineffectiveness in administering punishment for examination culprits and ineffective continuous assessment also contributed to examination misconduct. As can be seen, 88% and 80% of respondents

agreed on this, while only 12% and 20% disagreed on it, respectively. This suggests that students have never realized the negative consequences of examination malpractices.

Table 3. Measures to Combat Examination Malpractices in some select-ed Secondary Schools in the Banadir region

Insertion	Agree %	Disagree%	Total %
Corrective effort in enhancing discipline.	75	25	100
Formulation of effective punitive measures for examination malpractice culprits.	80	20	100
Intensification of supervision vigilance.	72	28	100
Increased continuous assessment.	88	12	100
Examination guidance and counselling.	75	25	100
Total	385	115	500

According to Table 3 above, corrective efforts in enhancing discipline could help fight examination malpractices, as 75% of the respondents agreed and only 25% disagreed, indicating that indiscipline is key to examination malpractices. Also, 80% of the respondents agreed on the formulation of effective punishment measures for examination malpractice culprits, while 20% had a different interpretation. This implies that corrective measures on examination malpractice are vital in restoring order during examination time in these schools. Intensification in the supervision cautions was found to be among the possible solutions to this crisis, as 72% of the respondents agreed on it and 28% disagreed. Constant valuation and examination guidance have been cited as vital in combating examination malpractices, as 88% and 75% of the respondents, respectively, agreed in this regard. This alone shows that students are psychologically not fully prepared for the examination.

4. DISCUSSION

The findings show that students carry prepared answers into the examination hall as 80% of the respondents agreed with this, while 20% opposed it. This implies that the form of practice is at its highest peak, beyond which any examination standard is not valid. 56% of the respondents suggest that going with a prepared examination sheet in the examination hall is normal in secondary schools within the Banadir region. This study supports the findings of Gross (2003), where it was found that carrying prepared answers to the examination halls is common practice for students in secondary schools in Banadir province. It was also discovered that copying from other students during an examination is a common practice, as 90% of the respondents agreed in this regard, and only 10% had a different perception. In fact, one can copy word for word and letter for letter from another student. Studies conducted by Gross (2003) also indicated one of the characteristics of unprepared students and less severe supervisors is the habit of copying each other. This demonstrates that there is less vigilance during examination time in the supervision exercise.

The findings also indicated that 75% of the students planned with invigilators to cheat on examinations, while only 25% opposed it. This is an indication of the lack or inadequacy of professional skills amongst teachers in these schools. Interviews with the respondents showed, to a larger extent, that most teachers in these schools have inadequate professional skills. In a similar manner, studies conducted by Oderinde (2003) indicated that examination malpractice could not be avoided in situations where teacher professional skills are inadequate.

The use of mobile phones and other electronic devices was found to be widespread, with 97.3% of the respondents supporting this view, while 2.7% rejected it. This implies that mobile phones, particularly smartphones, are carried into the examination hall and can easily be used by the learner on arriving at the answer. It was found that 88% of the respondents agreed on students exchanging materials during examinations. Interview findings generally indicated that technological advancement had been associated with increased examination malpractices. These results are in agreement with Daniel (2005), where it was ascertained that the advancement of

technology had created a significant challenge in examination malpractice in recent times.

According to the statistics, 92%, 94%, and 96% of the participants agreed that students' indiscipline, insufficient preparation for the examination, and ineffective supervision of students during the examination were found to be amongst the most outstanding causes of examination malpractices in secondary schools in the Banadir region. Only 8%, 6%, and 4% of the participants disagreed with each of the mentioned perspectives. This reveals a loophole in the examination system, both at the student and teacher levels. The interview also indicated that indiscipline students become too disruptive during examination time. They can cause turmoil in the examination hall without fear of negative consequences, which sometimes brings the exercise to a standstill. A report made by Sara Cottingham (2005) in Somaliland and Puntland also unveiled these loopholes as significant causes of examination malpractices in this area in general.

The result also indicated that 88% of the students desire to pass the examination by all means, while 12% opposed this view and this opinion. This also shows that students only want to pass the examination without doing the necessary studies. The interview results further revealed that most believed in passing the examination without putting in the required efforts. Similar observations were made by Sara Cottingham (2005). It was put on record that Somali students generally believe in a high grade, which is not commensurate with the effort put in. As a result, they resort to all forms of cheating in examinations.

The findings further indicated that ineffectivity in administering punishment for examination culprits and continuous assessment also contributed to examination malpractices. As can be seen, 88% and 80% of respondents agreed on this, while just 12% and 20% disagreed on it, respectively. This shows that students have never realized the negative consequences of examination malpractices. To further emphasize this point, interviews also indicated that students in secondary schools in this area are rarely punished, even after serious examination malpractices. Observations made by Baldwin et al. (1996) suggested that without a student realizing the negative consequences of examination malpractices, such a habit becomes inevitable.

The result also shows that corrective efforts in enhancing discipline could

help in combating examination malpractices, as 75% of the respondents agreed, and 25% disagreed. The findings from the interview also indicated that enhancing discipline is a key in combating these shameful examination practices in school by the students. One of the respondents amongst the teachers said that a disciplined student could not in any way be involved in examination malpractices. It was also found that 80% of the respondents agreed on the formulation of an effective punishment measure for examination malpractice culprits, while 20% had a different view. This implies punitive measures on examination malpractice are vital in restoring order during examination time in these schools. The interview also showed corrective actions like cancelling the complete examination for that student or that particular paper. If worse comes to worst, expulsion from the school could effectively combat these practices. One of the respondents amongst teachers said that without any written disciplinary action in the school rules and policies towards the learners, the student's behaviour becomes a nightmare.

Intensification of vigilance supervision was found to be among the possible solutions to this crisis, as 72% of the respondents agreed and 28% disagreed with it. Continuous assessment and examination guidance have been cited as vital in combating examination malpractices as 88% and 75% of the respondents, respectively, agreed with this idea. This alone shows that students are psychologically not well prepared for the examination. Interviews with stakeholders argued that one way of combating examination malpractices is through increased vigilance in the supervision role of the teacher. Similarly, an observation made by Baldwin et al. (1996) indicated that an examination is invalid without strict supervision and vigilance of the teachers.

5. CONCLUSION

On the basis of the findings, the following conclusion can be drawn:

- There are several forms of examination malpractice in secondary schools in Somalia, including direct cheating from a module or smuggling prepared answers into the examination hall.
- The significant causes of examination malpractice in secondary schools in the Banadir region were inadequate professional skills, lack of vigilance by supervisors during examination time, lack of preparation prior to examinations, and a lack of clear punitive measures for examination mal-

practice culprits.

- It was found that more vigilance in supervision, provision of examination guidance, and counselling to students could combat these malpractices.

6. RECOMMENDATIONS

Based on the above findings, the following recommendations are worthy of validity:

- Punitive measures such as examination cancellation and even expulsion in certain circumstances should be put in place for students found to have indulged in examination malpractices.
- New courses are to be conducted on a termly basis to enhance teachers' skills in effectively managing and conducting examinations.
- Prior to each examination, students should receive examination guidance and counselling.

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THE IMPACT OF CORONAVIRUS (COVID-19) ON HIGHER EDUCATION: A CASE STUDY OF PRIVATE UNIVERSITIES IN MOGADISHU, SOMALIA

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ABSTRACT

The study's main objective is to investigate the effects of COVID-19 on the higher education institutions in Mogadishu, Somalia. The duration of the research was fifteen days, involving two hundred respondents. The result shows that 56% of the educational foundations were closed during the initial stages of the pandemic, as per the government guidelines. According to the data, 22.5% of higher education institutions were partially closed and reported significant disruptions. On the other hand, 13% of higher education establishments were open for business and took no measures to deal with COVID-19. Most respondents in the study, 126 (66.7%), utilized Zoom Meeting to conduct classes and other activities, while 40 (21.2%) used Google Study Hall.

The primary constraint of online classes is that there are fewer personal meetings between the lecturers and students. In addition, online learning does not permit students to seek more clarification during the lessons. The challenge is to make the internet available to all students.

Keywords: Impact, COVID-19, Higher Education, Private Universities, Somalia, and E-learning.

1. INTRODUCTION

In 2020, the COVID-19 pandemic episode disrupted life around the globe. The pandemic influenced training from multiple points of view, as it did in some other divisions (Gonzalez et al., 2020). The government's choices have followed the shared objective of decreasing the spread of COVID-19 by reducing social contact, with an immediate impact in numerous nations staying away from face-to-face learning or potentially testing and migrating restrictions influencing Erasmus understudies (Sintema, 2020). Where possible, classes are being held by utilizing books and materials taken from school, through different e-learning stages that empower cooperation among instructors and understudies, and, at times, with the assistance of

using shows or web-based media stages. Some training frameworks declare extraordinary events as a more likely preparation for this separation learning scenario (Jiao et al., 2020).

Due to the prevalence of coronavirus infections in China, most Chinese schools have begun internet preparation in accordance with the organization's requirements of "directed teaching and learning". In a short time, a large number of representatives started to teach in front of a computer screen, and their understudies got the chance to stay and take the courses online (Liu, Bao, Huang, Shi, & Lu, 2020). With the spread of COVID-19 over the planet, as of 13 March, 61 countries in Africa, Asia, Europe, the Middle East, North America, and South America announced school closures, and an excessive number of schools actualized the closures (Abidah, Hidaayatullaah, Simamora, Fehabutar, & Mutakinati, 2020).

An appraisal is presumably the most provoking idea to be adjusted to the present new instructional framework, and various colleges are concerned about how to implement the correct assessment of understudies, aptitudes, and knowledge (Douglas, Katikireddi, Taulbut, McKee, & McCartney, 2020). The results of the school's conclusion may possibly reach the furthest limit of the scholarly year, raising concerns about the assessment and valuation of progress that quickly became a critical challenge to arrange. Another difficulty is the basis for determining whether understudies in their final academic year can focus enough or be adequately surveyed in terms of going to advanced education schemes (Toquero, 2020).

Luckily, several instruments are available to meet the challenge of inaccessible learning forced by the COVID-19 pandemic. Hence, the change of substance that has recently been instructed closely and privately is now effectively possible. Surprisingly, there are other significant tasks within the learning cycle, such as an appraisal or self-governing discovery, that will be tested without the immediate supervision of teachers (International Association of Universities, 2020).

In relation to the appraisal cycle, online assessment has become one of the most concerning ideas within the COVID-19 pandemic flare-up for two reasons (UNESCO & IESALC, 2020). To begin, educators need to update their on-site assessments to ensure they meet separation assessment prerequisites. Second, it's hazy to guarantee that understudies adhere to the rules

and do not utilize prohibited extra material in their assessment tests without the immediate supervision of teachers (Merkl-Davies, Doris, & Brennan, 2001).

In Somalia, the transmission of the infection has taken off after the first fourteen days of the conclusion of schools and colleges, wearing ragged the expectation that understudies would have the option to continue concentrating on grounds. The authority of colleges was constrained to concoct imaginative arrangements that could adapt to the emergency. Colleges depend on elective web-based learning stages, which have become one of the approaches to managing these remarkable conditions (Ahmed et al., 2020). This is similar to the advances made by learning foundations everywhere in the world. Colleges depended exclusively on customary physical classes to convey their projects until recently. However, web-based learning represents a new experience and adventure for colleges in Somalia. Most African nations are in a similar situation, as web-based instruction is uncommon on the mainland for reasons related to web networks, high costs of web information, and destitution (Yusuf, 2020).

The Zoom Meeting platform is the most commonly used online platform among universities because of its free-use option. However, because the accessible version of the Zoom Meeting session lasts for only 40 minutes, the classes have to be restarted after that time has elapsed. This disrupts the smooth running of the lecture and can only be avoided if a subscription of USD 15 per account is paid every month. This would obligate universities to subscribe to dozens of accounts according to the number of classes, and that would be a considerable expense for the already financially challenged institutions (Barre, 2020).

1.1 Online Teaching Challenges

The rapid, unprecedented, and unpreparedness for the transition to online teaching and learning has brought immense challenges to the Somali higher education institutions, the lecturers, and the students. This is similar to their peers across the world, although compounded by the fragile situation of the industry in Somalia. To begin with, universities lacked (and still lack) an effective and efficient Information and Communications Technology (ICT) infrastructure that could help to embark on efficient online teaching. Moving to remote learning has been extremely difficult for universities that

survive on scarce resources. Immediately, they adopted ubiquitous online conference and chatting applications with a shallow training tutorial for instructors and the student population to adapt and utilize for alternative instruction (Ahmed et al., 2020).

It became apparent that significant numbers of instructors had been conveniently using only whiteboards and textbooks rather than laptops, making it difficult for them to adapt to the new technology. This put pressure on respective faculties to provide the necessary assistance to the instructors in order to ensure continuous delivery of lectures online (Somalia Education Cluster Note on COVID-19 Preparedness and Response 11, 2020).

1.2 Impacts on Education

Each day, going to class is the most straightforward open arrangement apparatus accessible to support aptitudes. While educational times are regularly fun and should raise social aptitudes and social mindfulness from a monetary perspective, the first purpose of being in school is that it builds a child's capacity (Bao, 2020). Even an almost brief timeframe at school accomplishes this. Similarly, a comparatively short time away from school will have ramifications with respect to aptitude development. In any case, is the world ready to assess to what extent the COVID-19 interference will influence learning? Conditionally, utilization of different examinations to urge a large invitation is encouraged as the situation remains unknown (Wang et al., 2020).

1.3 Impact on Community and Family

We can perceive at least two channels through which the COVID-19 pandemic is apparently getting the chance to animate changing acknowledged practices and wants. One is found in the generosity of organizations. Various associations are directly emerging to be more aware of the childcare needs of their agents and respond by rapidly accepting more versatile work schedules and alternatively managing from home (Zhang & Ma, 2020).

Through learning by doing and evolving standards, a number of these progressions are likely to demonstrate industriousness. Therefore, in numerous spots, mothers and fathers with an equivalent will devour adaptability in fulfilling the joint needs of getting a vocation and raising a family. Because ladies are more exposed to competing requests, they continue to profit disproportionately (Wang, Zhang, Zhao, Zhang, & Jiang, 2020). A subsequent channel discusses common behaviours and good examples in single-fami-

ly households. While, in general, mothers will consume a disproportionate amount of extra childcare and self-teaching during emergencies, there will be a sizeable part of families where good examples will be reversed (Ahmed, Allaf, & Elghazaly, 2020).

2. GENERAL OBJECTIVE OF THE STUDY

The main objective of this study is to assess the impact of the coronavirus (COVID-19) on higher education—a case study of private universities in Mogadishu, Somalia.

Specific objectives are:

- To analyze the impact of the coronavirus (COVID-19) on higher education.
- To determine the socio-demographic effect of COVID-19 on higher education.

Significance of the Study

The study will benefit various agencies and individuals, especially academics, such as senior university members, faculty, students, and parents, and all the networks that furnish them with data on the impact of COVID-19 on training. Numerous understudies wish to expound on COVID-19 and would like to get valuable data about their concerns. This research has been developed to benefit the Somali people.

3. METHODS AND MATERIALS

3.1 Research Design

This study was a descriptive cross-sectional study design. Cross-sectional studies use questionnaires for data collection with the view of generalizing from a sample to a population.

3.2 Study Area and Target Population

The study participants were people living in Mogadishu, the capital city of Somalia. The case study took place in the Banadir region, which has seventeen districts. The study was conducted on people with higher education living in Mogadishu, Somalia. The survey was carried out for 15 days, and due to time constraints, the researcher set out to reach more than two hundred participants.

3.3 Sampling Procedure

A sample of 200 respondents was purposively selected from three hundred respondents, including parents, students, lecturers, and administration.

3.4 Data Collection

The researcher collected primary data through the application of a questionnaire. The data was collected for 15 days between 13th and 29th June 2020.

3.5 Data Analysis

Data collected was compiled and analyzed using the Statistical Package for the Social Sciences (SPSS) version 21.

3.6 Ethical Considerations

The written ethical approval and clearance were obtained from the research ethics committee at Somali International University (SIU). Participation was entirely voluntary, and the participants were not compelled to participate in the study. Even those who initially accepted to participate were free to withdraw during the course of the investigation if they did not wish to continue.

Table 1. Variables associated with socio-demographic characteristics

Variable	Frequency	Percentages
Gender		
Female	29	14.5
Male	171	85.5
Total	200	100
Age of the Respondent	Frequency	Percentages
18 - 25 years	140	70
26 - 35 years	48	24
36 - 45 years	6	3
46 years and above	6	3
Total	200	100
Educational level of the Respondent	Frequency	Percentages
Bachelor level	152	76
Master degree	32	16
PHD Level	10	5
Secondary	6	3
Total	200	100

Table 1 shows that the majority of respondents, 171 (85.5%), were male, while 29 (14.5%) were female. Furthermore, 140 (70%) of respondents were aged between 18 and 25 years, 48 (24%) were between the ages of 26 and 35 years, 6 (3%) were between the ages of 36 and 45 years, and 6 (3%) were age 46 and above years old. 152 (76%) respondents have a bachelor's degree, including 32 (16%) with master's degrees, who were among the most vulnerable groups in the education system due to COVID-19.

Table 2. Variables associated with the academic sector according to the impact of COVID-19

Position of respondents to the survey	Frequency	Percentage
Head of institution\President, rector and vice president)	5	2.5
Deputy head of institution (vice president...)	44	22
Registrar	30	15
Dean	24	12
Head of department	29	14.5
Faculty member	35	17.5
Lecturer	31	15.5
Others	2	1
Total	200	100
Academic institution	Frequency	Percentage
Our institution is open as usual, no special measures in place for COVID-19	27	13.5
Our institution is open as usual, but containment measures have been put in place to avoid the spread of COVID-19	30	15
Our institution is partially open, but there are major disruptions	45	22.5
All campus activities have stopped completely	98	49

Total	200	100
Did you have facilities that easily communicate with students (and staff) for updates and information?	Frequency	Percentage
Yes	189	94.5
No	11	5.5
Total	200	100
If you respond YES in the above question which program, did you use?	Frequency	Percentage
Zoom	126	66.7
Google classroom	40	21.2
Google Meet	17	9
Others	6	3.2
Total	189	100
If you already had a partnership with another Institution, has COVID-19 affected your partnerships?	Frequency	Percentage
Yes	168	84
No	32	16
Total	200	100
If Yes; How COVID-19 affected your partnerships?	Frequency	Percentage
It weakened the partnership	90	54
It strengthened them; we coordinated our efforts to respond to COVID-19	30	17.5
It created new opportunities with Partner institutions	48	28.5
Total	168	100
How does COVID-19 affect teaching and learning? (Please select only one)	Frequency	Percentage
It is not affected	4	2

Classroom teaching has been replaced by E-learning	110	55
Most activities are currently suspended, but the institution is working on developing solutions to continue teaching and learning through digital or self-study means	57	28.5
Teaching has been cancelled	29	14.5
Total	200	100
Do you expect you would be able to carry out exams as planned for this semester? (Please select one)	Frequency	Percentage
Yes, as usual	96	48
Yes, but through new measures	84	42
Yes, but only in part; some will be postponed	9	4.5
No, the majority of exams are at risk of being postponed	4	2
No, all exams are on hold	5	2.5
don't know	2	1
Total	200	100
Did your institution face challenges during online exams?	Frequency	Percentage
Yes	171	85.5
No	27	13.5
Don't know	2	1
Total	200	100
If yes, are there strategies being discussed to address the above issue of exams?	Frequency	Percentage
Yes	130	76
No	41	24
Total	171	100

Table 2 shows that deputy heads of institutions (vice presidents) accounted for 44 (22%) of the responses, while 2 (1%) accounted for others (other groups not mentioned in the list). The table also shows that the majority of academic institutions, 28 (56%), have closed. Still, some academic institutions, 45 (22.5%), said, “our institution is partially open, but there are major disruptions,” while 27 (13.5%) said, “our institution is open as usual, with no special measures in place for COVID-19.”

Most respondents, 189 (94.5%), said yes when asked, “Did you make facilities which easily communicate with students and staff for updates and information?” while 11 (5.5%) said no. Most respondents, 126 (66.7%), used Zoom Meeting, 40 (21.2%) used Google Class Room, 9 (11%) used Google Meet, and 6 (3.2%) used another method of e-learning. Also, the majority of respondents, 123 (77%), said yes when asked, “Do you believe COVID-19 will affect enrolments for the new academic year?”. In comparison, 61.5 (38.5%) said no. 123 (77%) respondents said yes when asked, “did any members of your senior management and lectures have been infected by COVID-19?” while 61.5 (38.5%) said no. The majority of the respondents, 168 (84%), said that COVID-19 had affected their partnership with another academic institution, whereas 32 (16%) said that COVID-19 did not affect their partnerships

Table 3. Variables related impact of COVID-19 on community (students and parents).

As a student, do you believe that COVID-19 has affected you?	Frequency	Percentage
Yes	184	92
No	10	5
Don't know	6	3
Total	200	100
Do you believe there is a difference between access to the classroom and temporary cessation of classroom activity?	Frequency	Percentage
Yes	194	97

No	6	3
Total	200	100
Did you face challenges regarding technology? (Internet, access Smartphones or Laptops)?	Frequency	Percentage
Yes	134	67
No	66	33
Total	200	100
Did you experience anxiety and depression regarding using these technologies during the COVID-19 crisis?	Frequency	Percentage
Yes	162	81
No	30	15
Don't know	8	4
Total	200	100
How has COVID-19 impacted on community (Parents)? (Please select only one)	Frequency	Percentage
It has not affected it	40	20
It has increased conflict between parents and students while students their base became in the home teaching	66	33
It has decreased parent's income	90	45
Don't know	4	2
Total	200	100
Dear parents, Are you carrying out daily activities in the context of COVID-19?	Frequency	Percentage
Yes, as normal	79	73
No, its effected by COVID 19	30	27
Total	109	100
Do you believe that COVID-19 will last a long time?	Frequency	Percentage
Yes	168	84

No	32	16
Total	200	100

When asked, “Dear parents, are you carrying out everyday activities in the context of COVID-19?” the majority of parents, 79 (73 per cent), responded yes as normal, while 30 (27%) said, “no, it’s affected by COVID-19.” While the majority of participants, 168 (84%), said yes when asked, “Do you believe COVID-19 will survive a long time?” whereas 32 (16%) responded no. In addition, when asked if they believe there is a difference between access to a classroom and a temporary cessation of classroom activity, 194 (97%) of students said yes. Participants were asked if they had faced technological challenges such as accessing the internet or smartphones or laptops; 134 (67%) said yes, while 66 (33%) said no. When asked how COVID-19 affected parents’ income, 90 (45 per cent) said they had decreased parents’ income due to additional needs from students.

4. DISCUSSION

Qualitative analysis of respondents

Dear participant, as you would like to think, what is the significant test and dangers your scholarly foundation has placed on considering COVID-19? When asked the question mentioned above, the majority of participants responded as follows: The major challenges of COVID-19 are that there is less discussion between lecturers and students about the course. The process of online learning does not allow students to get more explanations. Financial difficulties are among the challenges in this situation as the purchase of internet data is required to access network connection to participate in e-learning and meeting sessions, among other things.

Another respondent referenced the following words: “We live in the midst of what’s possibly one of the simplest dangers throughout our lives: worldwide training, huge instructive emergency. As of 28 March 2020, the COVID-19 pandemic is making quite 1.6 billion children and young people out of school in 161 nations.” The vast majority of our educational institutions that will be subjected to COVID-19 will most likely see a reduction in income and an increase in costs.

Three forecasts were shared as follows: 1) The use of mixed learning will skyrocket. 2) Online education is going to be a key priority at the establishment. 3) Existing and potential partnerships will be reconsidered.

Self-study/instruction: The researcher feels it's time to urge more experience-based ways like knowing e-separation learning. Also, it relies upon individuals to manage the value of their cash to contemplate everything whenever and wherever on earth.

A minimum of two channels have been recognized through which the COVID-19 pandemic is apparently getting the chance to animate changing acknowledged practices and wants. One track is to seek assistance from supervisors. Various associations and citations are now becoming increasingly aware of their delegates' childcare needs and responding by quickly accepting more flexible work schedules and managing other responsibilities from home (Zhang & Ma, 2020). Another channel is through learning by doing and evolving standards; some of these progressions are probably going to be demonstrated consistently. Therefore, mothers and fathers will pick up the same adaptability in satisfying the joint needs of pursuing a career and raising a family in numerous spots. Since ladies are more presented to those contending requests, they remain to benefit excessively (Wang, Zhang, Zhao, Zhang, & Jiang, 2020).

5. CONCLUSION

5.1 Higher Education Institutions

The temporary suspension of the attention to eye exercises of higher education institutions (HEIs) appears to be a significant disruptor of their work, according to advanced education foundations worldwide. The impact of this interruption is profound, and it is directly related to their ability to remain dynamic in their academic exercises as well as their financial viability. The endeavours made to keep encouraging courses in virtual mode are prominent everywhere, and, given the absence of involvement in comparative circumstances before, the exchange has not been simple.

Higher education institutions (HEIs) need adequately developed virtual training frameworks. Even within the ideal situation, it's hard to feel that they will be scaled up to the elemental measurements without the mediation of outer specialized support such as backing from videography specialists. To put it plainly, it's one thing to possess the essential mechanical and spe-

cialized framework to assist virtual courses for a generally critical level of graduate understudies.

5.2 On the Demand Side

For what might be compared to 1/4 or more, almost certainly, there'll be a decrease in popularity for the nonce and a spike within the following scholarly year when expenses are non-existent (as in Argentina) or genuinely reasonable. There'll be various understudies who will not re-visit study halls and whose rates are tough to measure for the nonce.

From a summary of undergraduate students, it's been determined that one in six understudies will not return to campus when face-to-face activities are resumed. Additionally, four out of ten will keep taking separate advanced education courses. The reasons for transient withdrawal are different. The primary and most elementary schools will be of monetary nature since the exit from the welfare emergency and its money-related ramifications will cause high jobless rates, and various families will be ruined. There are numerous purposes behind the transient decrease in demand for advanced education.

6. RECOMMENDATION

Policy considerations for private universities:

1) To relieve the effects of pandemics, all universities should endeavour to assign some of their limited assets to invest in Education and Technology (EdTech), such as learning the executive's frameworks. These are critical in the computerized age, and they will encourage teaching and learning in addition to traditional local education. Such mediation will likewise offer opportunities to the tons of potential understudies who are unable to attend nearby classes for various reasons and would improve the degree of readiness for questionable conditions and circumstances, which could mean no COVID-19.

2) Private universities should offer comments on the uprightness of the tests by stopping the escape clauses that have developed within the new online frameworks. If test pride is a concern, colleges need to consider deferring end-of-year tests and taking tests on campus or thinking of other potential and suitable options.

3) Under this condition, internet specialist co-ops should help college undergraduates by giving them sufficient information to assist them with remote learning.

4) In order to ease colleges' complete reliance on researcher populace educational expenses, the federal government of Somalia needs to give endowments to the universities and not limit its subsidizing just to the state-funded colleges. Furthermore, colleges must seek funding from sources other than student fees in order to continue operations.

5) Universities should use the opportunity provided by the pandemic to expand the extent of their activities by making their projects available online to potential students in various parts of Somalia, including those in locations where they are unable to attend classes for various reasons. Also, universities should share encounters and considerations on outstanding practices about online acing.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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Part II

Agricultural Development, Poverty Reduction and Environment

**IMPACT OF LAND DEGRADATION ON RURAL DEVELOPMENT
A CASE STUDY OF THE AFGOE REGION IN SOMALIA**

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ABSTRACT

Land degradation is a global issue with profound implications for biodiversity, eco-safety, poverty eradication, socio-economic stability, and sustainable development. It is caused by multiple factors, including extreme weather conditions, hefty rain, drought, and human actions that degrade soil quality, affecting food production, community livelihoods, and the production of other ecosystem goods and services. The deterioration in land quality, topsoil, vegetation cover, or water resources is usually caused by natural hazards, primary causes, or underlying causes. Natural causes are physical environment factors that lead to extraordinary degeneration hazards, such as steep inclines and the risk of water depletion. Direct causes are inappropriate land use and land management practices, such as the cultivation of steep slopes without soil conservation measures.

The underlying causes of these problematic land use and management archetypes are why these archetypes are practised. For example, inclines may be cultivated because those who are landless or poor require food, but preservation standards are not implemented because these landless farmers lack security of tenure. There is a difference, albeit with overlap, between inappropriate land use and inappropriate land management practices. Inappropriate land use refers to a situation where land is utilised environmentally improperly in terms of sustainability. On the other hand, inappropriate land management refers to land usage that could be considered sustainable if properly managed but where the necessary procedures are not followed. An excellent example is when there is a failure to adopt soil preservation strata-gems when deemed necessary.

Improper land management also refers to land use that is ecologically sus-

tainable at low intensities but becomes inappropriate at higher intensities due to poor management. Shifting cultivation and semi-arid rangeland grazing are other examples. For instance, I am avoiding irrigation water from the river during the first three weeks of river flow after a long period of drought, reducing the usage of chemical fertilisers pesticides and avoiding herbicides. The government should promote social awareness to curtail deforestation and human activities that contribute to land degradation. Social awareness must be raised, particularly among farmers, in order to clean up plastic waste on farms and avoid using plastic or to reduce single-use plastic or encourage recycling of plastic.

Keywords: Land degradation, rural development, sustainable development, Somalia, and semi-arid rangelands.

1. INTRODUCTION

Land degradation is the primary hazard to climate change and the food security pliability of rural societies everywhere in the world. Land degradation has become a major contemporary challenge to the global community's development agenda in one form or another. Its severity and extent increase in many parts of the world. This includes over 20% of all agribusiness, 30% of forests, and 10% of rangeland experiencing debasement (Thomas et al., 2015; Masto et al., 2015; Bai et al., 2013; Jafari and Bakhshandehmehr, 2013; Jones et al., 2010; Thomas et al., 2013). Land debasement is serious, especially for poor individuals who don't have the accessible means to remunerate the loss of land profitability and experience the ill effects of the created land shortage and sustenance frailty. Henceforth, it prompts harm to human culture and biological systems (Rao, 2015; Izzo et al., 2013).

This is additionally coupled by changes in biogeochemical and hydrological cycles in the earth's framework as well as the ruins advancement of new soil (Brevik et al., 2015; Berendse et al., 2015), all of which are vital for the sustainability of human progress and the resolution of issues like nourishment security, biodiversity, and monetary improvement (Lal, 2011). The debasement of land has implications for various key approach territories, including sustenance security, environmental change, surge risk administration, resistance to the dry season, quality of drinking water, farming flexibility despite new product ailments, biodiversity, and future hereditary asset administration (Young et al., 2015).

The land is a crucial asset for the eventual fate of humankind. It should be ensured and improved. Instead, the majority (52%) of all rape, including nourishment-creating soils, are currently polluted, with a large number of them severely degraded (UNCCD 2015). Through all of humanity's history, no less than twelve past civic establishments have bloomed on rich land and made tremendous advances, only to vanish after some time, as their territory dynamically debased and they could no longer encourage their populaces (Young et al., 2015). Soil is essential for farming and the nutrition found in food. Under the proper administration, soils are an interminably renewable asset. However, soils are a viable but extremely limited asset under the wrong administration. Under normal conditions, it can take 500 to 1,000 years to frame an inch of soil from parent shake (UNCCD, 2015). Besides, it is computed that dirt corruption costs between \$6.3 and 10.6 trillion dollars every year, all-inclusive. However, these expenses could be decreased by improving soil quality and employing more practical cultivating strategies (Young et al., 2015).

Land degradation has direct and indirect impacts on the livelihoods and economic opportunities of the rural poor. Natural, anthropogenic factors such as overgrazing, over-cultivation, inappropriate land use, and deforestation are the major causes and drivers of land degradation and desertification. Factors such as poverty associated with total dependency on natural resources by the poor are some of the indirect reasons driving land degradation (UN, 2015).

The immediate effects incorporate loss of biological community administrations, a decline in biodiversity, soil richness, supplement exhaustion, creature grub, wood generation, groundwater revive, brushing, chasing openings, tourism, and a decrease in rural profitability. In addition, there are increments in salinisation, alkalisation, waterlogging, soil disintegration, and soil compaction. The backhanded effects are the increments in tidy tempests, changes in stream and unwavering quality of stream water, poor quality of drinking water, siltation of water frameworks (waterways, dams, lakes, reefs), rustic destitution, sustenance uncertainty, ailing health, respiratory maladies (from clean storms), food and water-borne illnesses (from low quality of water and lack of cleanliness), and irresistible sicknesses (from populace relocation). Another effect is the struggle over common

assets, constrained movements, open distress, commitments to or diminished versatility against environmental change (ELD, 2015; UNCCD, 2012; WBCSD, 2015).

Land degradation's main drivers are soil erosion (Adugna et al., 2015), salinity, and absence of vegetation cover, which are probably going to impact neighbouring oceanic frameworks through dregs stacking, supplement exhaustion, and loss of natural matter, fermentation, and salination (Haile and Fetene, 2012). Debasement is a reduction in any or all of the qualities that make the soil suitable for delivering nourishment. Soil corruption happens through the crumbling of soil's physical, substance, and organic properties that result in soil compaction, salinisation, fermentation, and soil misfortune from wind and water disintegration (Young et al., 2015).

Disintegration is a natural process, and inordinate disintegration brings about critical topsoil losses, prompting a decrease in horticultural efficiency (Rabalais et al., 2010). Debasement jeopardises families and groups, as well as poses a threat to broader peace and steadiness. This can appear as a struggle between pastoralists and subsistence ranchers going after more beneficial lands or neighbours battling over progressively rare water and fuel resources. At the point when the ground gets to be distinctly ineffective, individuals are frequently constrained to relocate within or beyond borders, in some instances, abandoning their tribal land for congested urban territories (UNCCD, 2015).

Assessments done by Somali Water and Land Information Management (SWALIM) revealed that from 1980 to 2009, the most prevalent types of land degradation in Somalia were loss of vegetation, topsoil, and soil moisture decline. Vegetation loss comprises loss of vegetation species as well as vegetation cover. According to the evaluations, Somalia's central and northeastern regions are the most affected by the loss of vegetative cover. These areas had a net cover loss of 37% between 1982 and 2008, which translates into approximately 1.4% per year. Other regions were losing vegetation cover at an average rate of 0.6% per year.

The Shebelle River basin originates from the Bale Mountains in the eastern Ethiopian highlands and drains over an area of about 297,000 km², of which 108,300 km² lies in Somalia (Markakis, 1998). Arid to semi-arid conditions mainly characterise the climate in Lower Shebelle (Barry and Richard,

1992). The area receives between 500 and 800 mm of rainfall annually (Dyer et al.,1993). Mean annual temperatures range from 260°C to 280°C. Orographic and coastal influences increase rainfall variability (Griffiths, 1972), while the movement of the Intertropical Convergence Zone (ITCZ) results in four seasons, namely: Jiilaal (January to March), Gu (April to June, mainly rain-fed), Hagaa (July to September), and Deyr (October to December, especially irrigated) (FAO-SWALIM, 2010).

Data on soils in Somalia is scarce. Vargas et al. (2007) report that the grounds in the Lower Shabelle riverine zone are mainly composed of vertisols and gleysols (floodplain), which are poorly drained (FAO-SWALIM, 2010 p. 22-23). In Somalia, the Shabelle River covers about 1,236 km over a vast alluvial plain on a gentle slope of 0.25 to 0.35 m/km across Afgoe, Qoryoley, Marka, Kurtunwaarey, Sablaale, and Barawa districts (FAO-SWALIM, 2010 p. 2-3). The Shabelle River basin is linked to the formation of the Eastern Rift Valley System. The uplift of the Ethiopian highlands the deposition of thick volcanic ash and sedimentary rocks determined the geological setting of the Shabelle River. Downstream, the river is characterised by extensive sedimentary rocks. Buur Hills, an island of metamorphic and igneous rocks, defines the watershed that splits with the Juba basin. The Lower Shabelle River valley widens at shallow relief, leading to increased deposition of volcanic rock sediments scoured by erosive processes upstream. In the flood-prone zone, the river acquires its peculiar morphology where the riverbed appears higher than the surrounding floodplain (hanging or elevated river).

This is typical of rivers carrying sediment loads and whose reduced flow cannot keep it in suspension. The riverbed builds up, and the riverbank elevates to a very variable extent year after year. This allows the soils to retain enough moisture, allowing recession agriculture to thrive (FAO-SWALIM, 2010 p. 9-10). The main vegetation types in the riverine zone include closed and open tree canopies in temporarily flooded areas, woodlands, available shrubs, herbaceous and savannah vegetation. Rain-fed farmlands account for a large portion of the cultivated area, and irrigated agriculture is confined to the flood plains adjacent to the Lower Shabelle River (FAO-SWALIM, 2010 p. 16-21).

2. OBJECTIVES OF THE STUDY

1. To examine the causes of land degradation on rural development in

the Afgoe region of Somalia.

2. To determine the impact of land degradation on the source of income in the community in the Afgoe region of Somalia.
3. To suggest possible solutions to manage land degradation so as to approve rural development in the Afgoe region of Somalia.

3. METHODOLOGY

This study followed a descriptive research design by examining the personal meanings of individuals' experiences and actions (Polar and Thomas, 2000). It was designed as theoretical research to disclose the importance of the outcomes through investigating meanings, interpretations, symbols, social life processes, and relations. The researcher conducted in-depth interviews by speaking with participants in a one-on-one setting. Sometimes the researcher would approach the interview with a predetermined list of questions or topics for discussion but allows the conversation to evolve based on how the participant responds.

The study area was in Lower Shabelle, specifically the Afgoe district, where land degradation occurs in the form of destroyed vegetation, topsoil loss, and a decline in soil moisture. Loss of vegetation is comprised of the loss of vegetation species and vegetation cover. The study population includes selected Afgoe farmers in Lower Shebelle, and they were selected based on the long-term effects of land degradation on their lives. The target population of this study was 80 respondents from Afgoe.

Purposive sampling represents a group of different non-probability sampling techniques, and it's also known as judgmental, selective, or subjective sampling. Purposive sampling relies on the researcher's judgment when it comes to selecting the units and population target as the case study, and in this study, it is the Afgoe community. Usually, the sample being investigated is relatively small, especially when compared with probability sampling techniques.

The researcher developed a questionnaire instrument for collecting information about the data, and the data were analysed using a statistical package for social science (SPSS).

4. RESULTS

This chapter shows the presentation of data analysis and interpretation. The data analysis and interpretation were based on the research questions as

well as the research objectives. The exhibition was divided into two parts. The first part presents the respondents' profile or demographic information, while the second part focuses on presenting, interpreting, and analysing the research questions and objectives.

4.1 Profile of the Respondents

Table 1. Demographic Information of the Respondents

Category	Frequency	Percent
Gender		
Male	58	72.5
Female	22	27.5
Total	80	100
Age (years)		
18-27	47	58.8
28-37	12	15
38 and above	21	26.2
Total	80	100
Education level		
Primary	24	30
Secondary	22	27.5
Bachelor	34	42.5
Total	80	100
Marital Status		
Married	28	35
Single	43	53.8
Divorce	9	11.2
Total	80	100
Farming Experience		
Less than 3 years	40	50
3-5 years	15	18.75

5 years and above	25	31.25
Total	80	100

As indicated in Table 1 above, 72.5% of the study respondents were male, and 27.5% were female. According to the study under investigation, this implies that the male contributed more than the female. The majority of the respondents were between 18 and 27 years old at 58.8%, followed by those who were 38 years old and above at 26.2%, and 15% of the respondents were between 28 and 37 years old.

42.5 % of the respondents had a bachelor's degree, 30% had primary level education, and 27.5% had secondary level education. 53.8 % of the respondents were single, 35% of them were married, and 11% were divorced. 50% of the respondents had less than three years of experience in farming. 31.25% of the respondents had five years and above experience. 18.75% of respondents have had 3 to 5 years of experience.

4.2 Descriptive Analysis of Land Degradation

The level of land degradation was operational using ten questions in the questionnaire. These questions were based on the 5-Likert Scale, from strongly agree to disagree strongly. Respondents were asked to rate their level of understanding of land degradation. Each question was analysed using SPSS and summarised using the means and standard deviation as shown in Table 2.

Table: 2. Level of Land Degradation

Descriptive Statistics	Mean	Std. Deviation	Interpretation
Cutting the trees and shrubs for fuel and other purposes leads to a drought of land.	4.25	1.058	Strongly Agree
Monoculture practice causes depletion of nutrients and spreads plant diseases.	1.76	.937	Strongly Agree
Excess chemical fertility causes an imbalance in soil conditions, causing the soil to lose its ability to produce.	1.68	.993	Strongly Agree
Improper use of pesticides and other chemicals in soil leads to the loss of microorganisms in soil, which then lose nutrients.	1.64	1.074	Strongly Agree
When raindrops hit bare soil, the particles block the space between the soil, and the soil forms a crust that reduces infiltration and increases runoff. The fertile soil then erodes away.	1.58	.850	Strongly Agree
Excessive water erosion causes flooding and destroys the crop, causing desertification.	1.58	.959	Strongly Agree
Wind erosion removes the top soil, which reduces crop productivity.	1.51	.770	Strongly Agree
Soil structure destroyed by herds of cattle will cause more soil structure than soil compaction.	1.40	.685	Strongly Agree

Alien plants with disease and insects invade areas causes of failed crops.	1.36	.686	Strongly Agree
Fire is a farmer’s practice for diseases and insects altering pesticides to cause a reduction in biomass, which leads to erosion and land degradation.	1.35	.735	Strongly Agree
Grand Mean	1.81	0.87	Strongly Agree

Results in Table 2 indicate that the level of land degradation is strongly agreed upon by the participants, and this is indicated by the total mean average of 1.81. The total average standard deviation is 0.87.

4.3 Descriptive Analysis of Rural Development

The level of rural development consisted of 7 questions in the questionnaire. Each of these questions was based on the 5-Likert Scale, from strongly agree to strongly disagree. The respondents were asked to select their level of rural development and their responses were analyzed by SPSS and summarized using the mean, as shown in Table 3.

Table: 3. Level of Rural Development

Descriptive Statistics	Mean	Std. Deviation	Interpretation
Soil erosion contributes to low and declining agricultural productivity.	1.05	1.585	Agree
Unable to use agricultural productivity-enhancing inputs such as fertility, the crop will fail.	1.12	1.290	Agree
As a result of land degradation, farmers cannot gain many benefits from agricultural activities.	1.05	1.116	Agree

Due to the destruction of land production because of improper practices, the farmers are not able to feed their children.	1.78	1.005	strongly agree
Due to land degradation, farmers may migrate into cities.	1.67	.907	strongly agree
Due to failed crops, the workers are losing their jobs.	1.63	.890	strongly agree
The loss of arable land may increase poverty among the rural poor.	1.63	.914	strongly agree
Grand Means	1.42	1.10	strongly agree

Results in table 3 indicate that the negative impact on rural development is strongly agreed by the participants, and this is confirmed by the total mean average of 1.42. The total average standard deviation is 1.10.

5. DISCUSSIONS

The results indicated that land degradation has a strong negative impact on rural development, as in the case of Afgoe, Lower Shabelle, Somalia. This was emphasized by the satisfaction of the respondents, in line with their average mean score interpretation as well as standard deviation.

The cost of land degradation has been high. Large areas of the region's cropland, grassland, woodlands, and forest are now seriously degraded. Poor cultural practices, water, and wind erosion are the major problems. While salinity is minor, solidity and alkalinity are also widespread. Water tables have been over-exploited, soil fertility has been reduced, and mangrove forest has been cleared for aquaculture or urban expansion. Charcoal production has become a major form of land degradation, eradicating large areas of the best arable land from production.

Land shortage and poverty, taken together, lead to non-sustainable land management practices, which are the direct causes of degradation. Poor

farmers are led to clear forest, overgraze rangelands and make unbalanced fertilizer applications. Also, a decline in soil quality is another cause of land degradation and is considered to be responsible for the diminishing of huge areas of land. Year after year, huge hectares of land are lost due to soil erosion, contamination, and pollution. About 40% of the research area is agricultural land that is severely diminished in quality because of erosion and the use of chemical fertilizers, which prevent the land from regenerating. The decline in soil quality as a result of agricultural chemical fertilizers also leads to further water and land pollution, thereby lowering the land's worth on earth. Land degradation then leads to reduced productivity, either through a lower response to the same inputs or, where farmers possess the resources, a need for higher inputs to maintain crop yields and farm incomes.

The effect of these forms of land degradation on cereal production has so far been masked by the increasing levels of agricultural inputs that are used. However, the production of other crops, such as pulses, roots, and tubers, has now begun to decline. It is no coincidence that these crops are grown on land with a low potential of production, where rates of land degradation are highest. The result was supported by the findings of the Tomorrow People Organization (2017). Their study assessed land degradation as a threat to sustainable rural development in the northern highlands of Pakistan. Their study found that land degradation is a serious and rising worldwide problem that affects all sectors of human welfare, but the most important ones are agricultural resilience, new crop diseases, food security, and climate change, which lead to increasing poverty, drought tolerance, and loss of biodiversity. This postulates that land degradation has a strong negative impact on rural development.

The findings of the Tomorrow People Organization revealed that sheet, splash, and rill erosion affected the land of the respondents, and the significant factors responsible for this were deforestation and human activities. Important types of land degradation that existed in the area were land degraded by water, the decline in soil fertility, waterlogging, loss of vegetation cover, increased stoniness of land, and its extent varying from moderate to very high. The causes of the land degradation were the finishing of terraces, reduced soil reserves of moisture and nutrients, reduced seedling emergence and deforestation, loss to biodiversity, reeducation in crop yields, organic

matter, nutrient depletion, and loss to flora and fauna.

According to Oliver K. Kirui (2016), who published an article on the impact of land degradation on household poverty: evidence from a panel data simultaneous equation model, the findings of his study suggest that poverty contributes to land degradation as a result of poor households' inability to invest in natural resource conservation and improvement. Land degradation, in turn, contributes to low and declining agricultural productivity, which in turn contributes to worsening poverty. Specifically, land degradation significantly increases the probability of household poverty by 35% in Malawi and 48% in Tanzania. In Malawi and Tanzania, poor households are more likely to experience land degradation by 69% and 67%, respectively.

6. CONCLUSIONS

Land degradation simply means the deterioration of soil quality caused by factors such as improper land use, improper agricultural practice, and over-grazing for urban or industrial purposes. It involves the decline of the land's physical, biological, and chemical state. Indicators of land degradation include a decline in soil fertility, adverse changes in alkalinity, acidity or salinity, extreme flooding, use of toxic soil pollutants, erosion, and deterioration of the soil's structural condition. These elements contribute significantly to the annual depreciation of soil quality. Excessive land degradation thus gives rise to immediate and long-term impacts that translate into serious global environmental problems.

The consequences of soil erosion and quality decline are widely irreversible. Still, soil organic matter and plant nutrients can be replenished. To restore the lost soil mineral matter and organic content, it would require what is known as land reclamation. Land reclamation encompasses activities centred on restoring the previous organic matter and the soil's vital minerals. This may include activities such as the addition of plant residues to degraded soils and improving range management. Salinized soils can be restored by salt level correction, reclamation projects, and salinity control. One of the simplest but most forgotten methods of land reclamation is the planting of vegetation such as trees, crops, and flowers over the affected soils. Plants act as protective covers as they help make the soil stronger by stabilizing the land surface.

The main objectives of the study were to explore the effect of land degrada-

tion on rural development and to find out the effect of land degradation on income in a community, using the case of Afgoe Lower Shebelle, Somalia. In light of the findings, the results revealed that land degradation has a strong negative impact on rural development.

7. RECOMMENDATION

Based on the findings of the study, the researcher finds that the impact of land degradation on rural development can be decreased by ensuring all the concerned recommendations are based on the below objectives.

1. The government ought to provide innovative approaches to farmers in Afgoe to reduce the process of land degradation.
2. The government should provide land management practices at the farm level and policy formulation at the national level.
3. The farmer should avoid irrigation water from the river during the first three weeks of river flow after a long period of drought.
4. The farmer should minimize or avoid the use of chemical fertility and pesticides, while herbicides should also be avoided.
5. The government must promote social awareness to reduce deforestation and human activities that contribute to land degradation.
6. The community needs to create social awareness, particularly amongst the farmers, to clean up plastic waste on the farms and avoid the use of plastic, or reduce the single-use of plastic and recycle plastic.

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DETERMINANTS OF POVERTY IN AGRO-PASTORAL HOUSEHOLDS OF LOWER SHABELLE, SOMALIA

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ABSTRACT

Poverty is a complex, interlocked, and multidimensional phenomenon. The notion of poverty is used to refer to a wide-ranging set of interrelated life chances valued differently in the world's diverse cultures. The lack of awareness and inadequate understanding of the agro-pastoral way of life among policymakers has led to the exclusion of their particular issues from policy development. Policymakers in the past favoured crop farming, and such perceptions are generally ill-suited to the comparative advantages of pastoral areas and their way of life. Consequently, Somalia's agro-pastoralists have experienced decades of deterrent policies and socio-political exclusion. Agro-pastoralist development is vital for the sustainable growth of the Somalia economy. Sustainable poverty reduction in these areas requires long-term, holistic and integrated development interventions that necessitate the communities' genuine participation and empowerment. This research was conducted in Lower Shabelle, Somalia, with the specific objectives of estimating the magnitude of poverty and identifying determinants of household poverty. The study employs both primary and secondary data. A total of one hundred and sixty (160) randomly selected household heads were interviewed in person through a semi-structured questionnaire.

The data collected is analysed using descriptive statistics such as mean, standard deviation, and percentage. On the other hand, t and chi-square tests compared poor and non-poor sample groups to the explanatory variable. Besides, a logit regression model is also employed to identify the determinants of poverty in Lower Shabelle. Moreover, the Foster-Greer-Thorbecke (FGT) poverty index is used to examine the extent and severity of rural poverty.

The binary logit model estimation has also identified that a total of six variables, out of the eleven variables entered into the model, are found to be

statistically significant. These variables include family size, livestock ownership, farm size, dependency ratio, nonfarm income, gender, and age. The study shows a severe problem with poverty in Lower Shabelle. Therefore, to mitigate this problem and improve the well-being of rural households in the study area, some of the actions to be taken should include limiting family size and creating alternative livelihood opportunities other than just agriculture.

Keywords: determinants of poverty, agro-pastoralism, household poverty, Somalia, Lower Shabelle

INTRODUCTION AND BACKGROUND

Poverty has been registered as one of the most intractable economic and social problems of the twenty-first century. Around the world, about 20% of the population survives on less than a dollar a day. With regard to Africa, the problem of poverty is much deeper and far more widespread than in other major regions. Half of Africa's population lives in extreme poverty, and one-third suffers from hunger. Food security has deteriorated in Africa since the 1970s. The proportion of the malnourished population has remained within the 33% to 35% range in Sub-Saharan African countries, with over 70% of the food insecure population in the continent living in rural areas (ECA et al., 2009).

Like in other developing countries, poverty is a major social and economic problem in Ethiopia as well. The country is often reported as one of the poorest countries in the world, almost by all dimensions of poverty. According to the 2010/2011 Household Income, Consumption and Expenditure Survey (HICES), the proportion of poor people (poverty headcount index) in the country was estimated to be 29.6%, while the proportion of the population below the poverty line stood at 30.4% in rural areas and an estimated of 25.7% in urban areas. The poverty gap index is estimated to be 7.8%, while it is 8% for rural areas and 6.9% for urban areas. Similarly, the national level poverty severity index stood at 0.031, with the rural poverty severity index at 0.032, being slightly higher than that of urban areas at 0.027. In addition to this, the food and absolute poverty lines for 2010/2011 are determined to be Birr 1985 and 3781, respectively. The 2010/2011 rural

poverty headcount and poverty gap are lower than those of 2004/2005 by 23% and 5.5%, respectively. Still, the poverty severity of 2010/2011 is higher than that of 2004/2005 by 17%, indicating that rural inequality has started to rise (MOFED, 2012).

Ethiopia's pastoral and agro-pastoral communities constitute 10% to 12% of the total population. They inhabit the arid and semi-arid parts of the country; altogether, they occupy 61% of the country's landmass and keep over eleven million heads of animals. A more significant proportion of the population lives in the lowland areas of Ethiopia. Pastoralists engaged in extensive livestock herding, and the rest were agro-pastoralists who depended on the cultivation of crops and livestock herding. About 30% to 40% of the country's livestock population is found in pastoral and agro-pastoral areas. Poverty remains particularly intense in both areas in terms of low income and food consumption and high vulnerability to the risk of sudden drops in income. The coverage of social services and infrastructure is among the lowest in the country, and their traditional social, economic, and political systems have been eroded (Belay et al., 2005).

Above all, the lack of awareness and poor understanding of the pastoral and agro-pastoral ways of life among policymakers in the past have led to the exclusion of their issues from policy development. It is believed that policymakers in the past favoured crop farming. Such perceptions are generally ill-suited to the comparative advantages of pastoral areas and their way of life. Consequently, Ethiopian pastoralists and agro-pastoralists have experienced decades of deterrent policies and socio-political exclusion. Pastoralist and agro-pastoralist development are essential for the sustainable growth of the Ethiopian economy. Sustainable poverty reduction in these areas requires long-term, holistic and integrated development interventions, which, in turn, necessitate the genuine participation and empowerment of the communities. The concern over poverty has revived interest in the subject in academic and policymaking circles. UNICEF (2000) indicates that the international community's concerns over poverty have risen in tandem with the increased concern over human rights over the past decades. Poverty analysis from a variety of disciplines has constantly been asking questions about this phenomenon, sometimes out of curiosity, but often with the aim of providing information that can be used to overcome it. Therefore, identifying

the significant causes of poverty could help distinguish the intervention directions and inform policy options for tackling poverty by understanding the determinants of poverty in a location-specific context. In addition, it could improve the information and knowledge gaps that were hampering identifying and addressing the poor appropriately in the implementation of development programs and projects.

Poverty still poses a significant problem in the most developing world, especially in Sub-Saharan Africa. In Somalia, poverty and deprivation have become major problems, and they are significantly more widespread and severe in rural areas than in urban ones. Significant changes in the political climate, upheavals and migration caused by civil conflict and the increased frequency and severity of drought in recent years have taken their toll on the country's poor rural households and continue to affect them.

The majority of the rural/agro-pastoral population live far below the internationally recognised absolute poverty threshold of less than a dollar a day. Most of these people are chronically, or at least periodically, food insecure. To survive, most households resort to seasonal or permanent migration to urban areas in search of wage employment (IFAD, 2011). Somalia has enormous potential for agricultural development. At present, only about 25% of the country's arable land is cultivated, and agriculture is dominated by subsistence rainfed farming, which uses few inputs and is characterised by low productivity. The vast majority of farmers are smallholders. About 12.7 million smallholders produce 95% of the agricultural gross domestic product (GDP). These farmers are vulnerable to external shocks such as volatile global markets, droughts and other natural disasters. Smallholder farmers form the largest group of poor people in Somalia, and they cultivate half plots of one hectare or less and struggle to produce enough food to feed their families. A significant number of poor households face a prolonged hunger season during the pre-harvest period. Herders, like farmers, are vulnerable to increasingly frequent droughts, which can wipe out their livestock and assets, thereby causing severe poverty.

The persistent lack of rainfall is a significant factor in rural poverty. Since 2001, droughts have become more frequent and severe throughout the country, and the trend shows signs of worsening. Drought-induced famines devastate the more vulnerable households living in the pastoral and agro-pasto-

ral areas of the lowlands and the high-density parts of the highlands. Limited coping mechanisms and inadequate planning for drought mitigation make farmers more vulnerable to the devastating effects of drought (IFAD, 2011). Drought and/or crop failures can easily result in widespread food shortages, household food insecurity, and famine. In addition to their vulnerability to climatic conditions, poor rural people lack basic social and economic infrastructure such as health and educational facilities, veterinary services, and access to safe drinking water. Among the more specific causes of rural poverty in Somalia are ineffective and inefficient agricultural marketing systems, underdeveloped transport and communication networks, underdeveloped production technologies, limited access to support services, environmental degradation, and lack of participation in decisions that affect their livelihoods (FAO, 2012).

PROBLEM STATEMENT

The intensity of poverty varies at the household level in relation to the land's size, quality, productivity, climate conditions, and production technologies. Households headed by women are particularly vulnerable. Women are much less likely than men to receive an education, health benefits, or to have a voice in decisions affecting their lives. For women, poverty means more infant deaths, undernourished families, a lack of education for children, and other deprivations (UNDP, 2012).

The Somali region is among the poorest regions in Ethiopia. Reliable data on living standards is extremely difficult to come by, and a recent Central Statistical Agency report (2012) provides health data that is indicative of the extent of poverty. The Somali regional state is one of the most vulnerable regions in the country. It is subject to numerous shocks and stressors, mainly drought, human and livestock diseases, poor infrastructure, and conflict. According to the 2007 Population and Housing Census, the region has a total population of 4.44 million, of which 86.1% of the region's population lives in rural areas (CSA, 2008).

The study area, Aw-Bare district, is one of the zones of the Somali region where the majority of the population lives in poverty. According to the 1999/2000 Household Income Consumption Expenditure Survey (HICES) results, MoFED (2002) indicates that the poverty incidence in the research area is high. As a result, despite federal and regional efforts to combat pov-

erty, the region and its people face a high poverty rate. Though the problem is severe and demands a good understanding, there are no detailed studies conducted on the poverty situation and its relation with regard to poverty in the zone as well as the region. As a result, a number of essential and critical questions that are relevant to understanding the situation and for policy-making remained unanswered.

OBJECTIVES OF THE STUDY

1. To assess the poverty status of agropastoral households in the study area.
2. To estimate the magnitude of poverty in agro-pastoral households in the study area.
3. To identify the determinants of poverty in agro-pastoral households in the study district.

SIGNIFICANCE OF THE STUDY

The study area, in particular, has been plagued by poverty. Identifying and understanding factors that cause and perpetuate the problem at the household level deserves rigorous empirical research. This study will provide opportunities for households to effectively cope with poverty and generate the information required for policy design and intervention development and implementation.

A proper understanding of the factors affecting poverty is an essential starting point and a key to the formulation of policies, designing appropriate strategies, and practical steps that the government can take to reduce poverty and promote sustainable growth. As a result, it is expected that an understanding of the patterns of poverty and the relationship between poverty and the socio-economic factors that determine poverty can provide the necessary basis to develop appropriate policies and formulate intervention strategies. It will also contribute to the knowledge of the poverty status of agro-pastoral and rural households.

Therefore, the findings of this study will contribute to understanding the perception of the extent of poverty in society, its distribution and underlying features, and serve as a basis for alleviating poverty in the study area and other places with similar characteristics. Consequently, researchers, local governments, non-government organisations, and relevant stakeholders

may benefit from the study's findings to effectively direct their efforts towards alleviating poverty.

LITERATURE REVIEW

A glance at appropriate literature shows that there is no agreement on any meaningful definition of poverty. Evidence suggests that poverty is a multi-dimensional phenomenon. Poverty never results from a lack of one thing but from many linked factors that affect poor people's skills. It contains not only low financial income and consumption but also low human development factors, such as education, health, and nutrition (UNDP, 2000).

It goes beyond these measurements to include vulnerability and weakness. Its awareness varies by gender, age, culture, assets, and other social and economic contexts. Men may associate poverty with a lack of assets, whereas, for women, poverty influence is defined as the lack of financial and physical access to enough food to lead a healthy, productive life. Younger men reflect on generating an income as the most critical asset, whereas older men cite as the most important the status connected to the traditional agriculture lifestyle (Aalen, 2002). Different scholars define poverty in different ways. Minot (2000) described poverty as a household lying below the 25th percentile per capita consumption expenditure. On the other hand, poverty could be defined as a shortage of vital resources in terms of growth objectives. Poverty is a lack of basic human supplies, a condition arising mainly from the absence, scarcity, or underdevelopment of necessary resources or approaches to operating those resources (Edilegnaw, 1997).

According to Perking et al. (1997), poverty is a state in which a household's income is too low for it to be able to buy the amounts of food, shelter, and clothing that are thought necessary. A related level concept for poverty is the poverty line, which means a level of income or consumption that can withstand only a bare minimum standard of living (MEDAC, 1999; FAO, 2001). The World Bank (2000) defines poverty as "the incapability to reach a minimum standard of living" and distinguishes it from inequality, which "refers to the relative living standards across the whole society". The World Book Encyclopaedia (1994) states that "poverty is the lack of enough income and resources to live adequately by community standards". It highlights that these values and the definition of poverty vary according to place and time.

There are two common types of poverty. That is absolute and relative poverty. Absolute poverty is the inability to protect the minimum basic needs for human survival, that is, the income level below which individual households cannot meet basic needs. In the context of Ethiopia, absolute poverty is frequently construed as a lack of access to sufficient power to cover the cost of necessities. Relative poverty replicates the differences in living standards between the top and bottom strata of society. The relative poverty line is regularly set at a certain random fraction of the average income or expenditure in a country. So, the virtual poor are defined as people whose mean disbursement per annum falls below two-thirds of the national average expenditure per adult equivalent. It varies with the level of average income in the country (MEDAC, 1999; FAO, 2001). In general, poverty has a multi-dimensional surface. It is not considered only by the income status of households or per capita food production but also by other non-monetary social dimensions. It is characterised by insufficient food and calorie intake, a lack of access to health, nutrition, education, domestic water supply, and sanitation. Thus, in general, poverty can be defined as including all dimensions of the adversity people face in miscellaneous income and employment categories (World Bank, 2000).

Maxwell (1999) indicated that in the 1960s, the main focus of poverty discussion was on the level of income. Most viewers focused on macroeconomic indicators such as gross national product (GNP) per head. In the 1970s, poverty became a significant factor in advancing policy, highlighting the virtual deficiency. This was encouraged by work in the UK by Runciman and Townsend, who found countenance inconsiderate about 'restructuring with growth'. In particular, Townsend's work contributed to a significant redefinition of the poverty problem, not just as a failure to meet minimum nutrition or subsistence levels, but rather as a failure to keep up with the principles predominant in the assumed society at the time. Poverty in rich countries is now most often defined in this way, for example, as a level below half the mean income. The other major shift in the 1970s was to broaden the concept of income and poverty to incorporate a more comprehensive set of "basic needs," including those provided socially. Thus, following the pioneering work of the International Labour Organization (ILO) in the mid-1970s, poverty came to be defined as a lack of income and a lack of access

to health, education, and other services. On the other hand, in the 1990s, the UNDP developed the idea of “human development”; poverty can mean more than a lack of what is necessary for material well-being (UNDP, 2000). Poverty can be measured at national, regional, community, household, or individual levels. Poverty at national or regional levels is often a reflection of poverty at the household level. Despite the problems that exist in its measurement, several alternative measures are used in the development literature (Glue and van der Gag, 1988; Ahmed et al., 1991; Alderman and Garcia, 1993; Yohanes, 1995; Sowa et al., 2002). As a result, by different measurements of poverty, absolute and relative poverty are commonly used to signify the status of individuals and households as poor or non-poor by using a poverty line. The poverty line is a cut-off line that reveals the living standard below which a person is classified as inferior (World Bank, 1993). The absolute poverty level is fixed in terms of the living standard being used and set across the entire domain of poverty comparison (Ravallion, 1992). It is measured in terms of the minimum calorie intake required for survival, whereas relative poverty is measured in terms of a standard of living below the national or international average (Harland and Keddeman, 1984; Ahmed et al., 1994 as cited in Mohammed, 2001). This indicates that the conventional method or approach to poverty measurement is estimated by taking the income or consumption expenditure level that can sustain a bare minimum standard of living.

According to Thorbecke (2003), there are currently two main methods of setting the poverty line, i.e., the Cost of Basic Needs (CBN) and the Food Energy Intake (FEI) procedures. The CBN approach has the advantage of ensuring consistency by treating individuals with the same living standards equally. The FEI approach has the advantage of specificity, better-reflecting individuals’ actual food consumption behaviour around the caloric threshold given their tastes, preferences, and relative prices. The World Bank (2005) also suggests that a common and relatively satisfactory way of approaching capabilities begins with nutritional requirements. The most typical form of operationalisation is the CBN approach, while the FEI method has been suggested as an alternative when the available data is more limited. Literature indicates that three ingredients are required in computing a poverty measure. First, one has to choose the relevant indicator of well-being.

Second, one has to select a poverty line, a threshold below which a given household or individual will be classified as poor. Finally, one has to select a poverty measure to be used for reporting the population as a whole or for a population subgroup only. When estimating poverty using monetary measures, one may have a choice between using income or consumption expenditure as the indicator of well-being. Most analysts argue that provided the information on consumption obtained from a household survey is detailed enough; consumption will be a better indicator of poverty measurement than income for the following reasons (FSS, 2002; Sowa et al., 2002):

The first non-welfarist approach often used for drawing a poverty line is based on the basic needs or minimum caloric requirements, including direct calorie intake, food energy intake, and cost of basic needs methods. In the case of the direct calorie intake method, a poverty line is defined as the minimum calorie requirement for survival. Individuals who consume below a predetermined minimum level of calorie intake are deemed to be living in poverty. Hence, this method equates poverty with malnutrition. The drawback to this method is that it does not consider the cost of meeting the essential calorie requirement. It overlooks the non-food requirement. If poverty has to be measured by a lack of control over essential goods and services, measuring poverty by calorie intake alone is unlikely to reveal the extent of the impoverishment of a given society.

The second non-welfarist method of setting a poverty line is the food energy intake method. The basic concept behind this method is to calculate the per capita consumption at which a household is expected to meet its calorie requirements. In this case, the poverty line is then defined as the level of per capita consumption at which people are expected to complete their predetermined minimum calorie requirement. It is usually determined by regressing the per capita consumption expenditure on calorie intake. Then the predicted value of the per capita consumption expenditure at the predetermined calorie intake level is taken as the poverty line. This method is an improvement over direct calorie intake in terms of representativeness of the poverty line as it now provides a monetary value rather than the purely nutritional concept of poverty. However, suppose this method is applied to different regions and periods within the same country. In that case, the underlying consumption pattern of the population group just consuming the

necessary nutrient amount will vary.

The third method of setting a poverty line is the cost of primary needs method. First, the food poverty line is defined by selecting a “basket” of food items typically consumed by the poor. The quantity of the basket is determined in such a way that the given bundle meets the predetermined level of minimum caloric requirement. This “basket” is valued at local prices or national prices if the objective is to arrive at a consistent poverty line across regions and groups.

To account for the non-food expenditure, the poverty line is divided by the food share of the two poorest quartiles or quintiles, as the case may be. This method yields a representative poverty line in the sense that it provides a monetary value for a poverty line that accounts for food and non-food components. Unlike the food energy intake method, the latter provides consistent poverty lines across regions. Adjustments for spatial and inter-temporal variations could be made to set a consistent poverty line across regions, groups, and periods. Then a specific allowance for the non-food component consistent with the spending patterns of the poor is added to the food poverty line (Fields, 1993; Glewe & van der Gag, 1990).

Pastoralism is divided into two groups: (1) pastoral nomadism proper (pure pastoralists), which is characterised by the absence of agriculture and (2) semi-nomadic pastoralism (mixed farming). By using the degree of their movement based on the flexibility and the opportunistic nature of the pastoralists from high nomadic through transhumant to agro-pastoralists (Blench, 2001).

Agro-Pastoralism: Agro-pastoralists are settled pastoralists with land property rights who sustain themselves from crop production. Agro-pastoralists value their livestock but in terms of less reliance on livestock than nomadic and transhumant pastoralists. Agro-pastoralists are also described as “those who combine dryland farming with livestock keeping”. In the case of Ethiopia, agro-pastoralists employ a mixed farming system in which they practice both crop cultivation and the raising of a small number of animals, mostly cows, sheep, goats, and oxen. They have permanent houses and are more settled compared to other nomadic and transhumance pastoralists. They also act as brokers between sedentary and mobile communities (Fareh, 2003).

Nomadism: Refers to those who are exclusively pastoralists and dependent

on livestock. Nomadic societies are mobile based on their opportunistic search for pasture and water, mainly because the resources they rely on are few and dispersed. Their mobile lifestyle is caused by a lack of resources for their livestock and because they move to avoid disease outbreaks or security threats. Nomadic people do not build enduring settlements, they live in mobile houses like tents, and they are somewhat self-sufficient compared to other rural dwellers (Bante, 2009).

Transhumance: A type of pastoralist who makes regular movements between fixed points to exploit the seasonal availability of pastures. Another fundamental difference between transhumance and nomadic people in possession of permanent houses for the elderly, women, and small children, who remain with a portion of the livestock while the men take the remainder to grazing areas far from fixed settlements (Trautmann, 1985). In addition, transhumance pastoralists also practice limited crop production. This means that transhumance pastoralists do not depend as much on their animals for food; rather, they trade them in town markets in exchange for grain (Bante, 2009).

The Somali region has a diverse and varied livelihood system. These livelihood systems include pastoral, agro-pastoralist, farming (sedentary and riverine) and urban. Pastoralists are the most prevalent, comprising about 60% of the region's rural population. The term "pastoralist" refers to a method of agricultural exploitation based upon extensive herding, including the system in which the movement of the herds and men are major components. A pastoralist is a life system that entirely depends on livestock and rangeland communal resources. The mobility of livestock and communal resources of the rangeland are the key factors that differentiate pastoralists from sedentary styles of livelihood. Agro-pastoralists comprise about 25% of the total rural population, and their activities are a mixture of extensive livestock rearing and rain-fed crop production. Some may better be described as pastoralists with opportunistic crop farming activities, as in Fik and some parts of the Liban Zone. The remaining 15% of the rural population is comprised of sedentary people, mainly in Jigjiga and riverine Shebelle and Dawa-Ganale farmers. Both farming and agro-pastoral groups keep some livestock, but farmers' herds do not migrate and are sometimes hand-fed. They only migrate with other groups if there is a severe drought. The headcount ratio

of poverty in the Somali region is estimated to be 42% of the population, of which 45% and 35 % live in rural and urban areas, respectively. In comparison, the poverty gap and severity are estimated at 9.2% and 2.9 %, respectively (MOFED, 2008).

According to Bevan and Joireman, poverty is measured by adopting sociological approaches towards measurements of poverty, which are focused on meaning and using different measurements rather than absolute poverty, which they claim to measure. They emphasise that non-economic forms of capital, such as social and human capital, are essential in determining life chances in rural Ethiopia. Moreover, entitlement norms, which include things such as the right to access productive sources, political voice, the right to leisure, inheritance rules, and access to community support, are crucial in determining household poverty.

Given the above empirical studies' evidence that poverty reduction strategies and action should start at a localised level, this study adopted and applied both the quantitative and qualitative data analysis methods. Thus, the quantitative method was applied to the identification of the poverty status of a household with the support of descriptive statistics. A binary logit model was applied to identify determinants of poverty.

Ayanleh et al. (2005) revealed that the marginal effect analysis of the exogenous variables, such as cultivated land per adult equivalent, geographical location, education, and oxen ownership, are essential determinants for rural poverty in Ethiopia. Their findings indicate that poverty is best understood as a lack of household resource endowments, which means that households are deprived of essential livelihood assets. In addition, they suggest that it is crucial to differentiate among the poor and that attention needs to be paid to the poorest of the poor. Ayanleh et al. (2009) studied the extent and determinants of poverty in three districts in rural areas of eastern Ethiopia. They pointed out, among others, three main reasons that explain the extent and variation in poverty levels across households studied. (1) Poverty is location-specific. (2) Access to irrigated land (rather than land per se) and non-farm income are strongly associated with lower odds of poverty. (3) Involvement in networks is a strong predictor of the probability of being poor. Awel (2007) studied the vulnerability and poverty dynamics in rural Ethiopia. He examined the determinants of the household's welfare using fixed

effects regression. He found that larger farm sizes and female-headed households significantly improved the household's welfare. In contrast, the number of children and adults in the household negatively affected the household's welfare. He indicated that the likelihood of becoming both chronic and transient poor is positively affected by factors such as the age of the household head and the number of children in the household. He also revealed that factors such as dependency ratio, farm size owned, and participation in off-farm activities significantly reduce the likelihood of becoming both chronic and transient poor.

Dereje (2008) carried out a study on Determinants of Poverty in the case of Rural Dire Dawa Administration, Eastern Ethiopia. The binary logit model results show that among the explanatory variables included in the model, income from non-farm activities, tropical livestock units, size of irrigable land, credit experience of a household head, and the number of oxen-owned influenced the poverty status of the households negatively. In contrast, family size and dependency ratio influenced household poverty status positively. The possible explanation is that large family size would not be able to provide sufficient basic needs to family members because most of them are children and not economically active.

Shibru et al. (2011) studied the dimensions and determinants of agro-pastoral households' poverty in the Dembel District of Somali Regional State, Ethiopia. The scholars employed a binary logistic regression model to identify the determinants of poverty. They found that access to irrigation, distance from the market centre, farmland size, non-farm activities, educational status, livestock holding, and herd diversification significantly affected the probability of a household being poor. Semere (2008) also carried out a study on the dimensions and determinants of rural household poverty in the eastern zone of Tigray, Ethiopia. By using the binary logit model, he found that total family size and dependency ratio have a positive association with the poverty of the households. On the other hand, he also found that the age of the household head, households farm size, oxen holding, off-and non-farm incomes, access to irrigable land, livestock owned, and education level of the head of the household have strong negative associations with the household's poverty status.

RESEARCH METHODOLOGY

Social services in the district

Regarding social services, the education coverage of the Lower Shabelle is relatively good compared to other districts. The primary water sources for human and livestock consumption are ponds, shallow wells, and boreholes (ERA, 2003). Regarding the market (both output and input markets) availability, the district has two well-known markets in the zone located in Lower Shabelle. Besides these markets situated in the district, the agro-pastoralists of the district also use other cross-border markets (ERA, 2003).

The farming system

An agro-pastoral system characterises the farming system in the district. According to Westpac's identification of Somalia's agricultural systems, it falls into the 4th class that can be subclassified into nomadic pastorals and agro-pastorals. Land use in this system is both for crop cultivation and grazing. The agro-climatic conditions of the district are favourable for growing diversified types of crops and different species of animals. The total cropland area in the community is estimated to be 42,580 Ha or 10.43% of the entire neighbourhood. Production in the district is rain-fed, mainly undertaken by waiting for the rainy season, which is twice per year. Farmers in the area frequently face the dangers of drought and, as a result, food shortages if rain does not fall in sufficient quantities and follows its normal cycles.

The rainy season, known locally as Gu, the cropping calendar for land preparation and planting, begins from mid-March to the end of May. Both animals and tractors are used for land preparation. Also, men play a role in land preparation. The dry season, which locally is called Jilal, is from December to March, and it's that time for movement in search of pasture and water for the livestock. The rainy season, which is locally called Deyr, commences from October through December (aw-bare, 2012). So, the difference between Gu and Deyr is that during Gu times, it displays the rainy season and is available during the rainy season, but Deyr is not available during the rainy season; it is hot, and the land seems dry.

The livestock production system

Livestock plays a significant role in the agro-pastoral farming system of the study area. Livestock types kept by the farmers include camels, cattle, sheep, donkeys, and goats. Oxen are honoured to provide draft power, cows to provide farm households with milk and butter for consumption and sale,

donkeys for transporting goods, while sheep and goats are mainly kept for sale as well as for their meat. Natural grazing and crop residues are the most commonly used feed sources for livestock. The contribution of natural pasture as a source of feed is minimal due to the extensive coverage of the land by crops. Livestock rearing is a source of income, way of life, and prestige that is closely correlated with their herd size. They enlarge their herd when they have surplus money and convert it to cash when they need money. They consider livestock like a bank, especially camels.

At present, livestock-based farming is becoming less popular. On the one hand, due to the ever-increasing population growth trend, even marginal lands are becoming under cultivation. The other reason for reducing animal populations in the area is that farmers use a traditional and extensive system of animal production that cannot cope with the prevailing shortage of grazing land.

Sampling Techniques

The district is selected purposefully as representative of the agro-pastoral households of Somalia since there are a considerable number of agropastoral families in the district. In the process of selecting the sample, a multi-stage random sampling procedure was employed. In the first stage, three agro-pastoral villages were selected randomly from among the agro-pastoralist villages that exist in the district. The determination of the sample agro-pastoral households was done by using a simple random sampling.

Following the identification of the sample size, informal surveys, pre-survey visits, and a pre-test of the instrument were conducted.

The list of agropastoral households in the three villages of Lower Shabelle was conducted from the sample district and a representative sample of the agro-pastoral households in the three villages. This enabled a wide range of information collection by visiting the areas, dialogue with key informants, and participating in a focus group and community discussions. Based on the information obtained and the learnt experience from the informal survey, the questionnaires that were used in the formal study were drafted and structured. Moreover, the questionnaires were pre-tested for their appropriateness and further improved before using them.

Sample size determination

Sample size determination is an essential element in any survey research. However, it is a difficult one—existing literature debates on the issue of successful selection and the determination of meaningful sample size.

Determining sample size varies for various types of research designs, and there are several approaches in practice. A simplified formula for proportions developed by Yamane was used to determine the sample size in this study. Accordingly, Yamane (1967:886) provides a simplified formula to calculate sample sizes

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

Where

n is the sample size,

N is the population size, and

e is the level of precision.

According to the Central Statistical Authority (2007) estimates, the district's total population is about 339,056 people. 45% of the total population is female, and 55% of the total population is male, while the rural and urban populations are 88.29% and 11.71%, respectively. The total number of households in the agro-pastoral areas of the district are 20164. A 92% confidence level and $e = 0.08$ are inserted into Equation 1.

$$n = \frac{20164}{1 + 20164(0.08)^2} = 155 + 4 = 160$$

Then, according to Yamane's (1967) formula, a sample size of 160 agro-pastoral households was selected randomly from the three agro-pastoral sample villages. This sample size is assumed to enable us to gather richer data with regard to demographic, socio-economic behaviours, livelihood styles, environmental factors, traditional institutional setup, and others. After having the total number of households in each of the three sample agro-pastoral villages, a households' probability proportional to size was employed to select the sample households from the three agro-pastoral villages. Accordingly, the 160 sample chosen households have been interviewed using structured survey questionnaires developed for the purpose.

Sources and Methods of Data Collection

This survey was conducted using primary data collected through questionnaires. These structured questionnaires were used to gather information on household income, expenditure, access to public services, farm and non-farm income, and household assets, alongside a host of other information related to the production and sale of agricultural products. Four college or high school graduate enumerators who speak the local language fluently were recruited from the study area and were trained for the data collection. During the data collection phase, the researcher supervised the enumerators.

In addition to primary data, relevant secondary data was collected from the district agricultural office, administration, health department, water office, Somalia National Regional State line bureaus, NGOs, and organisations operating in the district.

Method of Data analysis

Descriptive statistics like percentages, mean values, frequencies, and chi-square were used.

Research measures of the poverty index and a logistic regression model were used to achieve the objective.

Estimation procedure

After completing the data collection phase, the responses were coded and entered into the Statistical Package for the Social Sciences (SPSS) software program. On the other hand, among the available approaches used to assess well-being and measure poverty money metric, a welfare indicator was se-

lected, and consumption or expenditure-based measure was used. Though income and consumption-based indicators are both used in assessing poverty, they have their own qualities. For many reasons, available literature indicates that, in general terms, consumption-based measures are preferred since they provide an adequate picture of well-being, especially in low and middle-income countries. In the second place, to determine the poverty status of a population, one has to establish or set a poverty line, a threshold level below which an individual is considered poor. Considering that the absolute poverty line is appropriate in low-income countries like Ethiopia, where absolute poverty is prevalent, the absolute level below which consumption is deemed too low to meet the minimum acceptable welfare is chosen for further use.

The method used for setting the absolute poverty line is the CBN approach because of its advantages over the other alternative ways. This method is based on the estimated cost of the bundle of goods and is adequate to ensure that basic needs are met. Accordingly, establishing a line starts with defining and selecting a “basket” of food items typically consumed by the poor. The quantity of the basket was determined in such a way that the given bundle meets the predetermined level of minimum energy intake (2200 kcal in this case). In the present study, the cost of the food bundle will be calculated using local market prices. Then a specific allowance for the non-food component consistent with the spending patterns of the poor was added to the food poverty line.

Actual household expenditure in this study was considered that of the household's total annual expenditure on consumption (including own produce). This actual expenditure per adult per annum was calculated by summing up all the expenditure components and dividing them by the household's total adult equivalent (AE). It includes the sum of self-produced and consumed goods (crops, milk, meat, butter, and other livestock products), food expenses (cereals, sugar, tea leaf, and others), clothing, health care, education, tobacco, social obligations (religious contributions, weddings, funeral ceremonies, and so on), household utensils, fuel, transportation, and other miscellaneous expenditures. Therefore, based on the food consumption behaviour and expenditure patterns of the agro-pastoralist households, a basket of food items typically consumed by the poor was identified.

According to various literature (MOFED, 2008; FSS, 2002), the food poverty line used in Ethiopia is based on a basket providing 2200 kcal per adult equivalent per day. Likewise, in this study, 2200 kcal per adult equivalent per day was used as the minimum calorie requirement per person per day, and this basket was valued using local market prices in order to reflect the actual food poverty line in the study area.

Taking the diet of the lowest income quartile households, the calorie share of the diets to the minimum calories required for subsistence was calculated to arrive at the level of calories and quantities of food group items that gave 2200 kcal (Ravallian, 1994). The quantities of the food item groups are valued using average local market prices in order to reflect the actual food poverty line in the locality.

Poverty index analytical model

The FGT poverty measure introduced by Foster, Greer, and Thorbecke (1984) was used to attain the second objective. The first step was to distinguish between the poor and the non-poor. In order to classify into two groups, demarcation points or lines need to be drawn in order to have a single measuring yardstick in poverty analysis. The poverty line, which is obtained by quantifying various well-being indicators, was used as the yardstick for poverty analysis in assessing well-being and determining who is poor and who is not. People are counted as poor when their measured standard of living (generally in either income or consumption) is below the poverty line. Otherwise, they are considered non-poor (Rath, 1996). Based on this, the headcount index, the poverty gap index, and the severity index of Foster-Greer- Thorbecke (FGT) have been employed in this study.

Headcount Index (HCI): This reflects the proportion of the poor in the total population by measuring the incidence of poverty in the whole population. It is insensitive to the depth or severity of poverty and, hence, is not suitable for assessing the impact of policy measures. The Headcount Index (HCI) is defined as the proportion of the population whose measured standard of living is below the poverty line. The headcount index does not tell us whether the poor are only slightly below the poverty line or whether their consumption falls substantially short of the poverty line. The headcount measure also does not reveal whether all the poor are equally poor or whether some are very poor and others just below the poverty line. In other words, this index

does not capture differences among the poor. This calls for the second poverty index, called the Poverty Gap.

The poverty Gap Index (PGI) estimates the average distance separating the poor from the poverty line. The poverty gap is understood as the amount of income transfer needed to close the gap. It is sensitive to the depth of poverty but not to its severity. The poverty gap index indicates the depth of poverty, which is the difference between the poverty line and the mean income of the poor expressed as a percentage of the poverty line. Neither HC nor PG, or any combination of HC and PG, captures poverty adequately. Because some move from being poor to better living standards, but both still remain below the poverty line, neither HC nor PG nor a combination of them will change. If all the poor had the same income, PG would indicate the intensity of poverty. Therefore, PG can be used as an indicator of potentially eliminating poverty by targeting transfers to the poor where the poverty gap yields the lowest possible cost. This, as well, has the drawback of being insensitive to the distribution of income among the poor. Besides these, the most widely used poverty measure is the severity index. This measures the mean of the individual poverty gaps raised to a power reflecting society's valuation of different degrees of poverty.

The severity of poverty: This depicts the severity of poverty by assigning each individual a weight equal to his or her distance from the poverty line. Hence, this takes into account the distance separating the poor from the poverty line and the inequality among the poor. Therefore, as Sen (1976) stated, the severity poverty index is specified to make PGI sensitive to income inequality among the poor. This poverty index, FGT, gives greater emphasis to the poorest of the poor by weighting each poor person by the square of their proportionate shortfall below the poverty line. FGT is more sensitive to redistribution among the poor in that a dollar gained by the poor would have more effect on poverty than that achieved by moderately poor people. FGT is more comprehensive because it increases when the number of poor people increases or the poor get poorer, or poorer get poorest compared with other poor people (Foster et al., 1984; Ravallion and Bidani, 1994).

The mathematical expression of the index is as follows:

$$P_{\alpha} = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^{\alpha} \quad (2)$$

Where,

p_{α} = Poverty Measures

Z = Poverty line

y_i = income level

n = sample size

q = number of poor people

α = is the weight attached to the severity of poverty.

In the equation (1), $z - y_i = 0$ if $y_i > z$. The measures are defined for $\alpha \geq 0$, and α is a measure of the index's sensitivity to poverty. The parameter α determines the weight given to the severity of poverty. For $\alpha = 0$, $P_0 = F(z)$, the cumulative income distribution at the poverty line z . In other words, for $\alpha = 0$, all poor are given equal weight, and P_0 equals the headcount ratio. For $\alpha = 1$, each poor person is weighted by the distance to the poverty line ($z - y_i$) relative to z . Thus, P_1 measures the distance to the poverty line for the average poor person, revealing the poverty gap. For $\alpha = 2$, the weight given to each of the poor is more than proportional to the shortfall from the poverty line. It is the squared poverty gap index.

In general, the headcount index is defined as the proportion of the population whose measured standard of living is less than the poverty line. However, this index does not capture differences among the poor. The poverty gap index indicates the depth of poverty, which is the difference between the poverty line and the mean income of the poor expressed as a percentage of the poverty line. This also has the drawback of being insensitive to income distribution among the poor. Besides these, the most widely used measure of the severity of poverty is the FGT index. This measures the mean of the

individual poverty gaps raised to a power reflecting society's valuation of different degrees of poverty.

Econometric model

To address the third objective of this study, the logistic regression model was employed to examine the influence of each factor on poverty. Logistic regression is best suited for the current study because the dependent variable is binary in nature, poor and non-poor. When the dependent variable is binary (0, 1), the OLS regression technique produces parameter estimates that are inefficient and have a heteroscedastic error structure. As a result, testing hypotheses and the construction of confidence intervals become inaccurate and misleading (Aldrich & Nelson, 1984).

Similarly, a linear probability model may generate a predicted value outside the 0 and 1 interval, which violates the basic tenets of probability (Gujarati, 1988). It also creates a problem of non-normality due to the heteroscedasticity of the disturbance term, thereafter leading to lower coefficients of determination (Gujarati, 1988). To alleviate these problems and produce relevant outcomes, the most widely used qualitative response models are the logit and probit models (Amemiya, 1981). There are two primary reasons for choosing the logistic distribution model. First, from a mathematical point of view, it is an extremely flexible and easily used function, and second, it lends itself to a meaningful interpretation (David, 2000). Even though the logit and probit models are comparable, Liao (1994) reported that the logit model has the advantage that the predicted probabilities can arrive at easily. He also indicated that when there are many observations at the extremes of the distribution, then the logit model is preferred over the probit model. Therefore, in this study, logistic regression models were used to fit and estimate the strength of the relationship between each factor and poverty when the other variables were controlled.

The logit models guarantee that the estimated probabilities lie between the logical limits of 0 and 1 (Pindyck and Rubinfeld, 1981). Because of this and other facilities, the logit and probit models are the most frequently used when the dependent variable is dichotomous (Liao, 1994). Accordingly, in this model, the dependent variable takes a value of 1 if the household falls below the poverty line, that is, poor with the probability of π , otherwise a value of 0, that is, non-poor with the probability of $1-\pi$. To estimate this

type of relationship requires the use of qualitative response models. Specification of the model is as follows.

$$p_i = \frac{e^{z_i}}{1 + e^{z_i}} \quad (3)$$

Where: p_i is the probability of the household being poor.

The probability that the household belongs to the non-poor will be $(1-p_i)$.

That is:

$$1 - p_i = \frac{1}{1 + e^{z_i}} \quad (4)$$

The odds ratio can be written as

$$\frac{p_i}{1 - p_i} = e^{z_i} \quad (5)$$

In linear form by taking the natural log of odds ratio:

$$h\left(\frac{p_i}{1 - p_i}\right) = h(e^{z_i}) = z_i \quad (6)$$

$$z_i = \beta_o + \sum_{i=1}^n \beta_i X_i + \varepsilon_i \quad \text{Where } i=1, 2, 3, \dots, n \quad (7)$$

n = the number of explanatory variables

o = intercept term

i = the coefficient of explanatory variables.

ε_i = disturbance term

X_i = explanatory variables such as age, family size, level of education, gender, landholding size, dependency ratio, livestock assets, etc.

The model will be estimated through an iterative maximum likelihood procedure with the help of SPSS computer software. The coefficients of the logit model represent the change in the log of the odds (poverty as a 0 or 1) associated with a unit change in the explanatory variables (Hanushek & Jackson, 1977, as cited by Edilegnaw, 1997).

$$VIF(X_j) = \frac{1}{1 - R_j^2} \quad (8)$$

Where: -VIF_j is the variance inflation factor of variable j.

R_{2j} is the coefficient of determination when one regress variable j on the remaining quantitative explanatory variables.

Similarly, contingency coefficients will be computed for dummy variables. If the value of the contingency coefficient is more significant than 0.75, the variable is said to be collinear.

$$C = \sqrt{\frac{\chi^2}{n + \chi^2}}$$

Where: CC is Contingency Coefficient; χ^2 is chi-square test, and n= total sample size.

Definition of Variables and Working Hypothesis

Once the analytical procedure and its requirements are known, it is necessary to identify the potential explanatory variables and describe their measurements. Different variables were expected to affect poverty status in the study area. The significant variables that were expected to influence the poverty states are presented and explained below.

A) The Dependent Variable of the Model (POVSTAT): The household poverty status, the dependent variable for the logit analysis, is a dichotomous variable representing household poverty status. It is represented in model 1 for the poor and 0 for the non-poor agro-pastoral households or individuals.

B) The model's independent variables: The independent variables that were expected (hypothesised) to have an association with poverty status were selected based on available literature and scientific research done earlier. Any exogenous variable having a negative coefficient is expected to reduce poverty, whereas the explanatory variable found to be positively related to

poverty status will deteriorate the well-being of the households; that is, it will increase the poverty level of the households. Efforts will be made to incorporate demographic, biophysical, and socioeconomic factors that are expected to be relevant in the agro-pastoralist livelihood systems of the Awbare district in particular.

1. Family size (FAMSZAE): This variable is the total number of adults equivalent to represent a total family size that lives together in the same household adjusted to adult equivalent. The expectation is that as the family size increases, the probability of the household's having disguised unemployment and dependency ratio will increase, which would affect the household's well-being. Therefore, family size is expected to have a positive relationship with poverty and negatively affect the household's well-being.

2. Dependency ratio (DEPENDENCY): This variable is the ratio of children under age 15 and people over the age of above 64 to total family (total dependency ratio) expressed in terms of adult equivalent. The existence of a large number of children under the age of 15 and the elderly aged 65 and above in the family could affect the household's poverty status. This is due to the fact that the working-age population (active labour force, i.e., 15-64 years old) supports not only themselves but also additional dependent people in their families. Thus, it is expected that a family with a relatively large number of dependent family members (high dependency ratio) has a direct relationship with household poverty status. Because of the high dependency burden, households with many economically non-active family members tend to be poorer than households with small families.

3. Household livestock ownership, including oxen (HHLvst): This is the total number of livestock held by the household, measured in Tropical Livestock Units (TLU). Livestock is the source of livelihood for most rural households in general, and large livestock owners are expected to be non-poor. The possession of livestock serves as a hedge against food insecurity and poverty, a source of cash income, a principal form of saving and investment, and is expected to positively impact a household's poverty reduction. Since households with a more significant number of livestock obtain more milk, milk products, and meat for direct consumption, large-scale livestock owners are expected to be non-poor. Besides, a household with a large livestock holding can obtain more cash income from the sale of live animals. Therefore,

it is expected that a higher number of TLU will increase the probability of the household's being non-poor. That is, as TLU increases, the poverty of the household reduces. Hence, it is expected that livestock owners will be inversely related to the poverty of the farmer's household.

4. Household non-farm income (HHnonfincm): This represents the number of various income sources received (in cash or in-kind) by the head of the rural household or any of the household members in the year in Birr. Income-generating activities and opportunities that bring various income sources are common practices in most households. In this regard, households that are engaged in such activities or receiving consumption from remittances, renting of pack animals, and other informal businesses would be better endowed with additional income to meet their food and non-food requirements. Hence, such income-generating activities determine the poverty status of the household. As a result, it is expected to positively impact poverty.

5. Distance from the market centre (Dstmrkt): This refers to the proximity of the household village to the nearest Woreda market, measured in kilometres. Access to the market for their agricultural products and other public infrastructure may create opportunities for more income by providing non-farm employment and easy access to inputs and transportation. Proximity to the market centre creates access to additional revenue by providing opportunities to engage in employment as well as sell different agricultural products, giving a household a better chance to reduce its poverty. It has been expected that households that have good access to the market centre have a better chance of improving their consumption.

6. Education level of household head (HHedu): This stands for the educational level of the rural household head measured in years of schooling completed. The rural household head is highly influential in the decision-making process in the family. Education equips individuals with the necessary knowledge of how to make a living. Literate individuals are very keen on getting information and using it. Education promotes awareness of the possible advantages of modern agriculture and the use of technological inputs and diversifies household income sources. As a result, the educational status of the head of the household is expected to have a negative impact on poverty.

7. Cultivated landholding size of the household (HHFrmsize): This refers to the total area of land in hectares cultivated by the household. Cultivated land is one of the livelihood assets used to produce food for consumption and to ensure household entitlement to food. Hence, households with more cultivated land can have better options to diversify and increase production. Consequently, it has been expected that the larger the endowment of cultivated land, the less chance there is of being poor.

8. Sex of household head (HHsex): This refers to the role played by the male or female household head in generating income from different sources. It takes a value of 1 if the household head is male and zeroes if otherwise. Male-headed households are better positioned to pull more of a labour force together than female-headed ones. Moreover, concerning farming experience, males are in a better position than female heads in the study area. Therefore, it has been expected that male-headed households are less likely to be poor.

9. Access to credit (CREDIT): This dummy variable takes the value of 1 if the agro-pastoral households have used the available source of credit or 0 if otherwise. Credit (formal and informal) is vital to resource-poor agro-pastoralists who cannot finance agricultural inputs at the early stages of adoption. Use of the available source of credit for agricultural purposes can relax agro-pastoralists financial constraints and make them willing to participate in technology adoption (Apata et al., 2010; Runsinarith, 2011). Therefore, the variable was anticipated to correlate with the probability of being poor negatively.

10. Age of household head (AGE): This is a continuous explanatory variable representing the age of the HH head. The influence of age on poverty is ambiguous. Some studies reveal that the likelihood of being immersed in poverty is inversely related to age. As the age of the household head increases, the person is expected to acquire more experience and be endowed with more assets (Abebaw, 2003; Yilma, 2005). However, others argue that as the age of the HH heads increases, there is a probability of having a large number of children that contribute to large family size. In addition, as the HH heads grow older, their ability and strength deteriorate, thus eroding their capacity to generate income. Hence, in this study, HHs with older HH heads are expected to be food poor compared to the HHs headed by the younger

ones.

11. Sale of milk (SALEMILK): A dummy variable. Milk is one of the main diets of pastoral societies in Ethiopia. It is also a source of income for pastoral communities. Some of the households in the study area earn their income from the sale of milk. If this sale is significantly high, it is expected that the probability of being poor will decrease. Hence, it is hypothesised that income from the sale of milk will negatively influence poverty.

The definition and label of measurement of the variables used in the model are presented below.

Table 1: Definition of Explanatory Variables Used in the Model

Variable	Type	Definition Variables
HHAGE	Continuous	Age of household head in years
FAMSIZE	Continuous	Family size in number
DEPCY	Continuous	Family's dependents <15 and >64
HHLVTTOCK	Continuous	Total number of livestock owned by the HH.
HHFRSIZE	Continuous	HH's farm land size cultivated
DSTM RK	Continuous	Distance from the local market
NON-FARMING	Dummy	Income from non-farm activities
HHSEX	Dummy	Consist of the male and female
SALEMILK	Dummy	Sale of milk: 1 if yes; 0, otherwise
HHEDU	Dummy	Illiterate, read and write, completed elementary school
CREDIT	Dummy	Income from loans

Source: Own Definition: 2015

RESULT AND DISCUSSION

INTRODUCTION

The data in this study were analyzed using both descriptive statistics and econometric analysis to give empirical evidence for the basic research questions and present the results and findings of the research. Hence, the FGT index was used to explain the level of poverty incidence. A descriptive analysis was used to explain the nature of poverty among the various agro-pastoral household characteristics, and a Binary Logit model was used to identify the determinants of poverty in the district's households.

Poverty level

Poverty Line and Indices

The study used a cost of basic needs approach by valuing a bundle of food items providing 2200 kcal (MOFED, 2002). The specific price of the basket of food was taken from the local markets. Then consumption per household was rescaled to account for the household size and composition. Conversion codes adopted by Stork et al. (1991) were used to convert household members of different ages and genders into adult equivalent units. To account for non-food expenses, the value of the food poverty line is divided by the food share of the poorest quartile total consumption poverty line per day and added together to become the total poverty line.

The food poverty line used in this study was then calculated from the collected data and is found at 2816.059 Birr , as shown in table 2. The non-food expenditure component is also calculated using the average food share of the lowest quartile households. The food share of the lowest quartile is found to be 59%. This figure is used to estimate an allowance for non-food expenditure and was found to be 1380 Birr. According to MOFED (2012), that gives a total poverty line of 4116 Birr/yr/AE, which is higher than the national poverty line of 3781 Birr per adult.

Table 2: Food Consumption of the house hold and Value of Food Poverty Line

Food Item	Mean Kcal / Kg/lt	Kg consumed/ day/AE	Kcal/ day/ AE	Kcal Share (%)	Kcal/ day/AE needed (Brr)	Average price (Brr)	Price per kcall (Brr)	Food poverty line	Expenditure Share %
Sorghum	3805	0.109	416.047	0.265	584.924	8	0.00210	448.877	15.94
Maize	3751	0.08577	321.734	0.2056	452.329	9	0.00239	396.135	14.067
Rice	3923	0.02365	92.788	0.0592	130.452	18	0.04588	218.474	7.758
Wheat	3623	0.0385	139.778	0.0893	196.515	10	0.00276	197.979	7.0304
Meat	1148	0.00198	2.276	0.0145	3.20036	70	0.06097	71.227	2.529
Milk	737	0.0321	23.692	0.0151	33.309	10	0.0135	164.966	5.858
Sugar	3850	0.1008	388.37	0.248	546.023	18	0.0046	931.785	33.088
Salt	1780	0.0211	37.714	0.024	53.023	8	0.0044	86.982	3.088
Oil	8964	0.0158	141.85	0.0906	199.44	30	0.0033	243.62	8.6514
Egg	61	0.00909	0.5547	0.00035	0.7799	12	0.196	56.0021	1.988
Total			1564.8					2816	100.00

Source: Researcher’s computation

Absolute Poverty Indices

The poverty measures (α) developed by Foster, Greer, and Thorbecke was used to explain the extent of poverty in the study area, as indicated in table 3. The resultant poverty estimates for the study area show that the percentage of poor people’s measures in absolute headcount index ($\alpha=0$) is 43.1%, implying that this percentage of the population is unable to get the minimum calorie (2200kcal per day per adult) and line under absolute poverty.

The poverty gap index (α_1), a measure capturing the mean aggregate consumption shortfall relative to the poverty line across the whole population, was 0.068, which means that a percentage of the total consumption needed to bring the entire population to the poverty line is 6.8 %.

Similarly, the FGT severity index (the squared poverty gap, (α_2)) in consumption expenditure shows that 2.5% falls below the threshold line, implying severe inequality. In other words, it means that there is a higher degree of inequality among the poorest population.

Table 3: Absolute poverty indices of sample households, Awbare

Poverty indices	Index value
Headcount index ($\alpha=0$)	0.431
Poverty gap ($\alpha=1$)	0.068
Squared poverty gap ($\alpha=2$)	0.025

Source: Researcher’s computation

Poverty and the Household Characteristics

Household family size in AE

The average family size of the study area was found to be 2.42 families, with respect to the specific characteristics of poor and non-poor households, as shown in table 4. The mean family size of the household head of the poor was found to be 2.8 with a standard deviation of 0.098, and that of the non-poor was found to be 2.11. Therefore, non-poor households had more family members compared to poor ones, and the difference was statistically significant at 1%.

Table 4: Distribution sample of Household by family size in AE

Family size	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
<2.5	0	0	20	22	20	12.5
2.6-4.5	27	39.1	42	46.2	69	43.1
4.6-6.5	28	40.6	28	30.8	56	35
6.6-8.5	12	17.4	1	1.1	13	8.5
>8.6	2	2.9	0	0	2	1.2
Over all	69	100	91	100	160	100
Mean	2.8		2.11		2.42	
Std	0.89		0.79		0.858	

Test of Significance t-value = 5.802 P-value =.000

Source: Researcher’s survey

Age of the household head and poverty

The age of the household head is among the critical determinant factors of poverty. In reference to table 5, the mean age of the sample household heads was found to be 44 years old. In this study, the young household head was 25 years old, whereas the old age was 65 years. The age of the household head group ranges from 36–45 and 46–60, which is the dominant age of the household head, with 38.1% and 25%, respectively. With respect to the specific characteristics of poor and non-poor households as shown in the tables, the mean age of the household head of the poor was found to be 43.32 years with a standard deviation of 10.66, and that of the non-poor was found to be 43.58 years with a standard deviation of 13.297. Accordingly, non-poor households are headed by older adults compared to poor ones, and this is statistically significant at a 5% probability level.

Table 5: Distribution of sample household by Age of household head in years

Age group	Poor (69)		Non -poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
15_25	8	11.6	11	11	18	11.2
26_35	12	17.4	14	15.4	26	16.2
36_45	20	29	41	45.1	61	38.1
46_60	20	29	21	23.1	41	25.6
>61	9	13	5	5.5	14	8.8
Over all	69	100	91	100	160	100
Mean	39.32		43.58		44.1	
Std	10.663		13.297		12.195	

t-value = 1.451

P-value = 0.0895

Source: Researcher's survey

Education level of household heads and poverty

Regarding the educational status of the household heads, the study results in table 6 show that most of the sample household heads are found to be illiterate. Almost 70.6% and only 26.2% of sample households could read and write. This is statistically significant at 5%.

Table 6: Distribution of sample household by Education level of household head

Educational level of household head	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
Illiterate	48	69.6	65	71.4	113	70.6
Read and write Completed	18	23.1	24	26.3	42	26.2
Elementary school	3	4.3	2	2.2	5	3.1
Over all	69	100	91	100	160	100

Test of Significance

Chi2 = 4.764

Pr = 0.025

Source: Researcher's survey

As shown in the table above, there is no significant gap between the poor and the non-poor. The difference was that 69.6% and 71.4% of the poor and non-poor were illiterate, respectively, showing that the poor are more illiterate than the non-poor. Poverty and education are inversely related, with only 23.1 per cent of the poor and 26.3 per cent of the non-poor able to read and write, respectively.

Livestock Holding of the Household

Table 7 shows the average livestock holding of the sample household to be 4.71 per family. The mean ownership of poor households was found to be 3.22 TLU, whereas, for the non-poor, the mean ownership was found to be 5.47 TLU. The standard deviation was 2.793 and 6.989 for poor and non-poor households, respectively. There is a mean difference in TLU between the two groups, and as expected, the poor households have less TLU compared to non-poor households. This finding is statistically significant at less

than a 1% probability level. This indicates that poor households have fewer livestock compared to non-poor households in the study area.

Table 7: Distribution of sample household by Livestock holding in TLU

TLU	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
<1	9	13	7	7.7	37	29.60
1-2.49	6	8.7	6	6.6	20	16.00
2.5-3.99	10	14.5	6	6.6	16	12.80
4- 5.49	11	15.9	13	14.3	14	11.20
5.5- 7	10	14.5	19	20.9	16	12.80
7.5-10	4	5.8	12	13.2	22	17.60
>10	19	27.5	28	30.8		
Over all	69	100	91	100	161	100
Mean	3.22		5.47		4.71	
STD	2.793		6.989		2.011	

Test of Significance t-value = 2.796 pr =.006

Source: Researcher's survey

Gender of the Households

As seen in table 8, 60.9% of households are poor, and the other side of the non-poor households is 53.8%. Similarly, out of 160 counts of household heads, 36.1 are poor households led by a female and 46.2 are non-poor households led by a male. 91 (56.9%) are led by a male, and 69 (43.1%) are led by a female. With respect to poverty status, 42 male-headed households are categorized as poor, and only 49 male-headed households belong to the non-poor category. The statistical analysis is significant at 5%.

Table 8: Gender of the households

Gender of HH	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
Male	42	60.9	49	53.8	91	56.9
Female	25	36.1	42	46.2	69	43.1
Overall	69	100	91	100	160	100
Mean	1.15		2.70		2.30	
Std.deviation	0.50		0.77		0.70	

Test of Significance

t-value = 2.910

pr =0.022

Source: Researcher's survey

Sale of milk and poverty

As shown in Table 9, most sample households sell milk as one of the income sources from which these agro-pastoralists get additional income to support their lives. This shows milk is an important source of income. Out of a total of 160 samples, 57.5% sell the milk, while 42.5% do so for various reasons. 43.5% of the poor households and 58.2% of the non-poor households sell milk or get additional income from the sale of milk, while 56.5% of the poor households and 41.8% of the non-poor households do not sell milk.

Table 9: Distribution of sample households by status selling milk

STATUS OF SELLING OF MILK	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
SELLING	39	43.5	53	58.2	92	57.5
NOT SELLING	30	56.5	38	41.8	33	42.5
Overall	69	100	91	100	160	100

Test of Significance CHI2 = 1.516 P=0.892

Source: Researcher’s survey

Farm Land Holding Size Per Household

Although the new land policy of the country recognizes that the households in these agro-pastoral households still own land, the land is sold, inherited, and transferable like any other personal possession. The size of the farm is so vital for the betterment of the household’s welfare. A farm is a productive asset for farmers. A farmer without a farm is thus no longer a farmer. The mean average farm size is 2.50, as indicated in table 10. Therefore, farm size is an important factor that easily distinguishes the poor from the non-poor. On average, 1.90 poor households have 2.33 ha of land compared to non-poor households. This is in line with the findings by Dercon et al. (1996). The study confirmed that the poor cultivate less land and that poverty and land ownership are closely linked, and it is statistically significant at a 5% probability level.

Table 10: Distribution of Sample Households by Farm Size Per House-

Farm size per household	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
0-1	31	44.9	24	26.4	55	34.4
1.1-2	27	39.1	41	45.1	68	42.5
2.1-3	4	5.8	11	12.1	15	9.4
3.1-4	3	4.3	7	7.7	10	6.2
4.1-5	2	2.9	3	3.3	5	3.1
>5.1	2	2.9	5	5.5	7	4.4
Over all	69	100	91	100	160	100
Mean	1.90		2.33		2.50	
STD	1.48		1.785		1.288	

Test of Significance t-value = 2.014 pr= 0.046

Source: Researcher's survey

Table 11: Distribution sample of household by Grazing land

Grazing land	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
<1.5	13	18.5	20	22.2	33	20.6
2.6-4.5	27	38.6	23	25.6	50	31.2
4.6-6.5	8	11.5	12	13.5	20	12.5
6.6-8.5	15	21.4	21	22.2	35	21.9
>8.6	6	8.6	15	16.5	21	13.1
Over all	69	100	91	100	160	100
Mean	2.67		2.85		2.92	
STD	1.31		1.42		1.95	

Test of Significance t-value = 0.235 P-value =.0.403

Source: Researcher's survey

Grazing land is still owned by the households in these agro-pastoral households. Land is sold, inherited, and transferable like any other personal possession. According to table 11, the mean average size of grazing land is 2.92. As a result, grazing land is one of the critical factors that distinguish the poor from the non-poor, and some of the grazing lands can be converted into cultivable land to be productive. On average, 2.67 of the poor households have 2.85 ha of land compared to non-poor households. At the same time, the standard deviation is 1.31 for the poor and 1.42 for the non-poor.

Dependency Ratio and Poverty

Dependency ratios were hypothesized to be positively or directly related to poverty. So, households with a large dependency ratio tend to be poorer than those with a small ratio. As hypothesized accordingly, it turned out that non-poor households have a larger dependency ratio than poor households, with a mean of 1.90 and 3 for the poor and non-poor, respectively, as shown in table 12. The standard deviation was 0.805 for the poor and 0.973 for the non-poor households, which is statistically significant at 5%.

Table 12: Distribution of Sample Households by Dependency Ratio

Dependency ratio	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
<1	31	44.9	34	37.4	65	40.6
1_2	24	34.8	27	29.7	51	31.5
>2	14	20.3	27	29.9	41	25.6
Over all	69	100	91	100	160	100
Mean	1.90		3		2	
STD	0.805		0.973		0.890	

Test of Significance

t-value = 1.842

P-value = 0.08

Source: Researcher's survey

Non-Farm Income of the Households

Non-farm income is the amount of income received by the head of a rural home or any household member from various sources (in cash or kind) that year in Birr. Most households engage in income-generating activities and opportunities that provide a variety of income streams. Households that engage in activities, such as receiving remittances, hiring pack animals, or engaging in other informal businesses, would be better equipped to meet their food and non-food requirements. Hence, such income-generating activities determine the poverty status of the household. As a result, it is expected to have a negative impact on poverty. The average amount of non-farm income of the poor and non-poor households was found to be 492.61 and 734.05, respectively, as shown in table 13. Statistics also showed that there was a mean income difference between the two groups at a 5% probability level.

Table 13: Non-farm income (dollar)

Non-farm income (Birr/yr)	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
Less than 500	34	49.3	51	56	85	53.1
5001-1000	20	29	26	28.6	46	28.8
1001-2000	11	15.9	10	11	21	23.1
Above 2000	4	5.8	4	4.4	8	5
Over all	69	100	91	100	160	100
Mean	492.61		734.05		629.93	
STD	459.883		945.469		781.55	

Test of Significance

t-value = 1.952

P-value = 0.053

Source: Researcher's survey

Distance to the Nearest Market

As indicated in Table 14 below, the average distance to the nearest market is estimated at 3.51 km, with 3.38 km for poor households and 3.44 km for non-poor households. According to this finding, non-poor households travelled a much greater distance to reach the nearest market centre than poor households. This implies that proximity to the nearest market does not affect the poverty status of the community within the time set, that is, 3.51 km, and it is significant at a 5% level.

Table 14: Distance to the nearest Market

Distance from the nearest market in Km	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
0-5km	3	4.3	10	11	37	29.60
6-10km	20	29	14	15.4	20	16.00
11-15km	17	24.6	24	26.4	16	12.80
16-20	10	14.5	16	17.6	14	11.20
21-25	15	21.7	23	25.3	4	4.4
>16	4	5.8				
Over all	69	100	91	100	160	100
Mean	3.38		3.44		3.51	
STD	1.373		1.416		1.394	

Test of Significance
Access to credit services

t-value = 3.4

P-value = 0.819

Table 15: Credit of the household

Status of credit	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
Credit access	37	53.6	56	61.5	93	58.1
No credit access	32	46.4	35	38.5	67	41.9
Over all	69	100	91	100	160	100

Test of Significance Chi2 = 1.300 p=0.384

As can be seen in table 15, the credit available to poor and non-poor households is 53.6% and 61.5%, respectively. The households that do not have access to credit make up 46.4% of the poor and 38.5% of the non-poor households.

Agricultural Input Use and Poverty

Access to information or extension messages as well as various extension services was one of the determinant factors hypothesized to influence households' wellbeing. The extension is supposed to have a direct influence on the condition of the agro-pastoralist community. When there is contact with an extension agent, the possibility of the farmer being influenced to adopt agricultural innovations is greater. Information sources available for farmers in the study area are only through Development Agents (DA). Sample respondents were interviewed to give their opinion on how they got extension services and input, such as the use of fertilizers and improved seeds and training. As indicated in table 16, out of the 160 respondents, 64.4% are non-users or are not able to obtain the various extension services. In contrast, 24.4%, 8.8%, and 1.9% are able to use and obtain fertilizers, improved seeds, herbicides, and insecticides, respectively.

Table 16: Distribution of sample household by extension services and input use

Extension Services Status	Poor (69)		Non-poor (91)		Total (160)	
	No	Percent	No	Percent	No	Percent
Non users	44	68.8	59	64.8	103	64.4
Fertilizer	19	27.5	20	22	39	24.4
Improved seeds	6	8.7	8	8.8	14	8.8
Herbicide	0	0	3	3.3	3	1.9
Insecticide	0	0	1	1.1	1	6
Over all	69	100	91	100	160	100

Table 16 further shows that out of 160, 27.5% and 8.7% of the sample groups obtain or use extension services such as fertilizers and improved seeds, respectively. 22%, 8.8%, 3.3%, and 1.1% of the non-poor get or use extension services such as fertilizers, improved seeds, herbicides, and insecticides, respectively. In comparison, non-users were found to be 68.8% and 64.8% of the poor and non-poor, respectively.

Determinants of Poverty

In this section, the selected explanatory variables were used to estimate the logistic regression model and examine household poverty determinants. A logit model was fitted to evaluate the effects of the hypothesized explanatory variables on the probabilities of being non-poor or not. The data were subjected to STATA 10 to undertake the econometrics analysis.

Prior to the estimation of the model parameters, it is crucial to look into the problems of multicollinearity or association among the potential candidate variables and heteroscedasticity (variance of the dependent variable varies across the data) to overcome the problem of heteroscedasticity. The remedial solution taken was to regress the variables with robustness. The variance inflation factor (VIF) was used to test the degree of multicollinearity among the continuous variables. Contingency coefficients were computed to check

for the degree of association among the dummy variables.

Table 17: Variance Inflation Factors (VIF) of the Continuous Explanatory Variables

Variable	VIF
DEPCY	1.01
TLUAE	1.02
FARMSIZE	1.03
HHFRSZE	1.02
HHAGE	1.03
DISTCE	1.03

The values of VIF for continuous variables were found to be small, with VIF values of less than 10. To avoid serious multicollinearity problems, it is critical to exclude any variable with a value of 10 or more from the logit analysis. Based on the above VIF result in table 17, the data has no problem with multicollinearity. As a result, all six explanatory variables were retained and entered into logistic regression analysis.

Also, the contingency coefficients, which show the association between various dummy variables, were computed to check the degree of association among the discrete variables. The values of the contingency coefficient range between 0 and 1, and zero indicates no association between the variables and values close to 1 indicating a high degree of association. The computation results reveal there was no severe problem of association among dummy explanatory variables as the contingency coefficients did not exceed 0.75, which is mostly taken as a cut-off point. Hence all five dummy variables were entered into the logistic analysis.

Table 19: Classification table

Observed		Predicted				
Poverty status		Poverty status		Percentage correct		
Poor	Non-poor	Poor	Non-poor	Poor	Non-poor	Over all %
69	91	67	80	69.6	79.1	75

This classification results from cross-classifying the outcome variable with a dichotomous variable whose values are derived from the estimated logistic probabilities. In this approach, estimated probabilities are used to predict group membership. Presumably, if the model accurately predicts group membership according to some criterion, this is thought to provide evidence that the model fits. The model results in table 19 show that the logistic regression model correctly predicted 75% of the total sample of agro-pastoralists to be 79.1% of non-poor and 69.6% of poor groups.

Table 20: Result of Binary Logit Model Estimates

Variable	Coefficient	Robust Std. Err	Marginal effect	Wald static	p-value
FAMSIZE	1.863	0.351	-0483548	28.197	0.000
HHLVTOCK	-0.201	0.104	-.0545913	3.764	0.052
DEPCDY	0.661	0.250	.0752176	7.003	0.08
HHEDU	0.365	0.386	-0362622	0.894	0.344
HHAGE	0.408	0.189	-.0144856	4.644	0.031
HHSEX	-1.023	0.447	.1393738	5.242	0.022
DSTM RK	-0.034	0.150	-.0120237	0.053	0.819
HHFRSIZE	-0.587	0.201	-.0445149	8.496	0.004
SALEMILK	0.055	0.418	-0274281	0.018	0.895
NON-FARMINC	-0.426	0.240	-.0002135	3.151	0.076
CREDIT	0.509	0.413	-0015792	1.520	0.218
Constant	-2.647	1.523		2.998	0.083

LR chi2 (11)	104.6
Logit > chi2	0.000
Log-likelihood	-25.88
Pseudo R2	
0.60	

Source: Model output from the survey data

Among the 11 variables considered in the model, seven variables were found to be the determining factors of the level of poverty with up to a different probability level with their expected sign. Family size, the number of live-stock owned per adult equivalent, the hectares of a farm owned per household, non-farm income, age, dependence ratio, and gender are among the variables considered. At the same time, the remaining four explanatory variables were found to have a statistically significant influence on the poverty status of the households.

Family Size (HHSZE): This variable appeared highly significant in determining a household's poverty at a 1% probability level and was positively associated with the household's poverty. The positive relationship indicates that the odds ratio in favour of the probability of being non-poor decreases or the likelihood of being poor increases with an increase in family size. The odds ratio of 6.44 for family size implies that other things being constant, the probability of being poor increases by a factor of 6.44 as family size increases by one adult equivalent. This is in agreement with the hypothesis that family size is likely to play a role in determining the state of poverty at the household level. The study conducted by HICE & WMS (MOFED, 2002) has similarly shown that total household size has an independent effect on the probability of falling into poverty. The variable was significant at a 1% probability level.

Livestock owned (TLU): Herd size is negatively and significantly (at 1% significance level) related to the probability of being poor in the area. The negative relationship is explained by herd size being an agro-pastoralist resource endowment. Agro-pastoralists with large herd sizes have a better chance to earn more income from livestock production. This, in turn, enables them to purchase the required amount of food and non-food consumption items even when there is a shortage of resources for the others. This empirical finding suggests that total livestock holding is important in explaining the poverty status of the sample population in the districts. The odds ratio for total livestock holding indicates that when the household herd size increases by 1 TLU, the probability of the household being poor decreases by a factor of 0.818. This is consistent with the findings of Stefan and Krishnan (1998) that revealed households with substantial physical capital (ownership of fac-

tors of production, such as livestock and oxen) have lower poverty levels and are more likely to become better off over a period of time.

Farm size (FRMSZE): Farm size was significant in determining the poverty status of the sample agro-pastoral households. As the findings suggest, the more hectares a household has to cultivate, the higher the possibility of the household being out of poverty. This is at a 5% significance level. In line with this, Stefan and Krishnan (1998) revealed that households with substantial physical capital (ownership of factors of production, such as farmland) assets have lower poverty levels and are more likely to become better off over time. The odds ratio for farm size holding indicates that other things are constant when the household's hectares increase by 1 unit, the probability of the household being poor decreases by a factor of 0.556.

Dependency Ratio (DPDCERATIO): It is hypothesized that a family with a relatively large number of dependent family members (high dependency ratio) has a direct relationship with household poverty status. A household with prominent economically non-active family members tends to be poorer than those households with small family sizes because of the high dependency burden; as the findings suggest, the possibility of the households being out of poverty is at a 5% significance level. The odds ratio for dependence ratio in the farm of the probability of being poor increases by 0.359 as the dependence ratio decreases by one. On the other hand, the poor household decreases by a factor of 0.08. This result is also in agreement with the findings of MoFED (2002) for rural Ethiopia except for the difference in terms of the significance level. Most of the dependency ratio is explained by a large number of children under the age of 15, and due to low life expectancy, the relative number of people over the age of 65 is small.

Household Non-Farm Income (HHnonfincm): It represents the amount of various incomes received (in cash or kind) by the head of the rural household or any of the household members in the year in Birr. Income-generating activities and opportunities that bring various income sources are common practices in most households. In this regard, households that are engaged in such activities or receiving income from remittances, renting of pack animals, and other informal businesses would be better endowed with additional income to meet their food and non-food requirements. Hence, such income-generating activities determine the poverty status of the household.

As a result, it is expected to have a negative impact on poverty at a significant level of 5%.

Gender of Household Head (Hhsex): This refers to the role played by the male or female household head in generating income from different sources. It takes a value of 1 if the household head is male and 0 if otherwise. Male-headed households are in a better position to pull more of the labour force together than female-headed households. Moreover, concerning farming experience, males are in a better position than female heads in the study area. Therefore, it has been hypothesized that male-headed households are less likely to be poor or negative on poverty, with a significant level of 5%.

Age of Household Head: This is a continuous explanatory variable designating the age of the household head. The likelihood of being immersed in poverty is inversely related to age. As the age of the household head increases, the person is expected to acquire more experience and be endowed with more assets. However, there is also an argument that as the age of the household head increases, there is a probability of having a large number of children, which contributes to large family sizes. In addition, as the household head gets older, their ability and strength get weaker, and the age of 61 and above in the family could affect the household's poverty status. This is due to the fact that the working-age population supports not only themselves but also additional dependent persons in their families. Thus, it was hypothesized that to have a positive relationship with poverty; the result must be found to have a positive relationship with a significance of 5%. This is consistent with the findings of Stefan and Krishnan (1998).

SUMMARY

This study was conducted in Lower Shabelle. The study's main objectives were to measure the intensity of agro-pastoral households' poverty and analyze the determining factors associated with it in the study district. The study made use of both primary and secondary data. Primary data was collected from sample heads of agropastoral households in three district villages, from which information on demographic, economic, and institutional aspects was obtained through semi-structured survey questionnaires. A simple random sampling technique was used to select the number of households in each village that would be different. A probability proportionate to size was used to select 160 respondents (household heads). Besides the

primary data, relevant secondary data was collected from different government offices and NGOs.

In measuring poverty, the consumption expenditure approach was used. Following the establishment of the poverty line through the use of the cost of basic needs (CBN) method, the factors determining food poverty status were examined using descriptive statistics and an econometric model. In the analysis of the data, the FGT poverty index (developed by Foster, Greer, and Thorbecke) was used to attain the objective, which is related to the intensity of agro-pastoral food poverty, while to capture and identify determinants of food poverty in the study area, the logit binary model was employed. Accordingly, out of the total sampled agro-pastoral households, 69 were poor, and the remaining 91 were not poor. The food poverty line was 2,816 per adult person per year. The three common poverty indices were found to be 0.431, 0.068, and 0.025 for headcount, poverty gap, and poverty severity, respectively.

CONCLUSION

The principal objective of this study was to assess the determinants of poverty in the agro-pastoral household society of the District in Somalia's regional state. Specifically, the study has attempted to determine and identify the different indices of deprivation through collecting data on the socioeconomic characteristics of poor and non-poor households and thereby identify the significant determinants of poverty.

The study used both primary and secondary data sources. The primary data was collected from the household survey, and the secondary data was compiled from various sources. A two-stage random sampling procedure was followed to select three villages from 53 villages. In the second stage, 160 households were selected randomly through probability proportional to the size of the village households. A structured questionnaire was employed to undertake the interview during the data collection.

The cost of basic needs approach was used to calculate the poverty line. Accordingly, the food poverty line was found to be 2816.059 (59%) Birr per year per adult equivalent and an allowance for non-food expenditure was found to be 1380 Birr per year per adult equivalent. Together these made the total poverty line for the area 4116 Birr per year per adult equivalent.

Following the identification of the poverty line for the area, the FGT indices

of poverty were used to identify the severity of poverty. The indices result shows that the headcount ratio is 0.43125 implying that 43.125%. Also, the poverty gap index shows 0.068 implying that 68% of the total consumption is needed to bring the entire population to the poverty line. The poverty severity was found to be 0.025, implying that 2.5% of the poor fall below the poverty line, indicating the magnitude of the inequality among the poor in the area. A logistic regression model was used to identify the continuous and discrete potential candidate variables capable of affecting the poverty status in the district. The model results reveal that among 11 explanatory variables included in the logistic model, seven were found to be significant at different probability levels in the district.

The results from the logit model reveal that TLU (LIVESTOCK) is an important determinant affecting the state of poverty and has shown a negative impact at a 1% significant level which implies that the third most important factor was family size (HHFSZE) and has established a positive relationship to poverty at a 1% significant level. Farm size per adult equivalent (FRMSZE) was also shown at a 1% significant level and negatively correlated with poverty. Dependence ratio (DPDCERATIO) is hypothesized that a family with a relatively large number of dependent family members (high dependency ratio) has a direct relationship with household poverty status. A household with prominent economically non-active family members tends to be poorer than households with small family sizes because of the high dependency burden. As the findings suggest, the possibility that the households were out of poverty was at a 5% significance level.

The Age of Household Head (AHH) is a continuous explanatory variable that represents the age of the household head. Age has an inverse relationship with the likelihood of living in poverty. As the household head's age increases, they are anticipated to gain more experience and be endowed with more assets. However, there is also the argument that as the age of the household head increases, there is a probability of having a large number of children, which contributes to having a large family size. In addition, as the individual ages, their ability and strength diminish, and at the age of 61 and above, the family could be affected by the household's poverty status. This is due to the fact that the working-age population supports not only themselves but also additional dependent members of their families. Thus, it is

hypothesized that there is a positive relationship between age and poverty at a significant level of 5%.

RECOMMENDATION

By looking critically at both approaches to assessing poverty status and identifying determinants of a HH's poverty status in study areas, the following are recommendations based on the research findings.

Family Size (FAMLSIZE): Family size has been shown to be significant at a 1% probability level. Households with large family sizes found it challenging to secure basic necessities because of the high dependency ratio. Thus, the possibility of a family's income increasing as additional family members are added is very low, or none at all. Projects or programs that work on family planning need to be encouraged to maintain and minimize household size to the level of household income capability. The implementation of family planning programs should be supported with the current health-extension package by giving high emphasis to local people's perceptions of household size and their attitudes towards family planning facilities.

The dependency ratio at a 10% significance level from the study results calls for policymakers to focus on projects like family planning. Large family size is a problem for the HH if the non-productive members are high, and awareness creation should be the first task to tackle this problem. Therefore, organizations working on the health stream need to create strategic approaches for the utilization of family planning facilities. Since the rural communities are Muslim, natural birth control and other alternatives should be assessed by considering family planning facilities' cultural and religious aspects.

Livestock rearing has dual purposes, for income and as a food source. These alternative husbandry potentials are extremely important (at the 1% significance level) in preventing a family from becoming impoverished. Projects like dairy cow credits, sheep and goat credits, and fattening need to be supported with the necessary husbandry skills and knowledge training to expand in-depth livestock management concepts to increase family income. Management of herds (stocking and restocking) and utilization of improved feed and fodder need to be given due attention.

Non-farm income activities have become a supportive income source and are able to determine household poverty status at a 5% probability level.

This indicates that a household could secure the income for basic necessities by participating in any of these alternate options for non-farm activities, like petty trading. Organizations involved in women's small trade projects should be encouraged to target the poor in their interests in non-farm activities. Creating alternative livelihood opportunities could help in mitigating the problem.

The size of the land of the household and food poverty are negatively related, indicating that a large farm size improves the well-being of farm households. Land size is one of the determinant factors of food poverty status, despite its limited nature in that there is no room for area expansion in most parts of the study area. Improvements in agricultural technologies that enhance land productivity per unit area should be developed, and training of farmers in land management should be given due emphasis. As the result showed, off-farm income-generating activities also play an important supplementary role in enhancing the self-provisioning of agro-pastoral households. In this regard, interventions like capacity building, agricultural research, agricultural marketing and credit, as well as infrastructures that sustainably enhance off-farm activities, need to be designed.

Lastly, the livelihoods of many households in the district were seriously affected by the drought. Thus, although poverty assistance may not be a long-term solution to the underlining causes of household poverty, it seems imperative to continue the relief handout for some time to keep alive those who have no access either to produce or buy food. But, the link with the employment-generating system would help reduce the dependency syndrome and contribute to local development.

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Part III

Technology, Engineering, Public Relations and International Relations

A STUDY ON THE EFFECT OF INTERNET ADVERTISING ON SOMALI BUSINESSES

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ABSTRACT

The internet is becoming an essential advertising tool for Somali businesses. While the number of internet users in Somalia has increased over the last ten years, some Somali firms have focused on internet advertising to grow their client base and have boosted their internet advertising budget to entice new customers. Companies always target young people to grasp the profit potential and convert them into loyal customers. In a way, they want to turn them into “unchanging” consumers. In order to achieve this, the internet, which young people extensively use, has become the most crucial tool.

The shift in the marketing mindset is reflected in their businesses. Companies are digitising their marketing knowledge and attempting to attract young people using their smartphones with easy and quick access to the internet that they always carry with them in their pockets. Advertising is the most effective tool for accomplishing this. The transformation also has an impact on the advertising medium, which is shifting away from the traditional notion of advertising and towards the digital platform. There is almost no research on internet advertising in the Somalia business.

For this reason, the study aims to explain the change in marketing and trade understanding of businesses in Somalia, with a particular focus on Somali population attitudes and behaviours towards internet advertising and online shopping. The researcher conducted a sample and fieldwork study with 200 participants who were assumed to be more interested in the internet. The result revealed that Somalis’ interest in the internet had increased over the last ten years, and they found internet advertising to be effective. As a result, although e-commerce has not significantly developed in Somalia, there has been significant growth in the Somali population’s desire to shop online.

Keywords: Internet advertisement, online shopping, e-commerce, attitudes towards internet advertising, classical advertising.

INTRODUCTION

In the early 1990s, the world entered an unprecedented period of technological innovation. The communication industry has undergone a significant transition that has led to the total convergence of the information, communication, and media sectors as well as the concept of new media, which has emerged as a result of this convergence. The new media, which today's businesses employ as a strategic weapon to reach out to new customers, is a medium that enables communication between businesses and the general public and communication among the masses. The interaction that occurs throughout the execution of both processes constitutes the most crucial advantage of this medium.

In this new media age, where the concept of interaction is becoming more critical with the advent of the internet, a gradually shrinking world has emerged where distances and locales are interconnected and social relations worldwide are consolidated. These transformation processes have changed the types of advertisements that shape social life, disturbing the traditional structure. With the advancement of technology, interactive commercials have had an impact that can quickly compete with conventional media advertisements. The pace of adoption of new media has a significant impact on the effectiveness of traditional media advertisements. Interactive advertisements evolve in parallel with the increased usage of new media, and investments in this field are gradually increasing.

With the increase in the number of internet users in Somalia over the last ten years, many businesses have expanded their interest in internet advertising in order to carry out marketing operations on the internet.

1. THE TRANSITION FROM TRADITIONAL MEDIA TO SOCIAL MEDIA

When the worldwide network was first introduced, it was often used to convey information to passive readers, as it was popular with newspapers and magazines. The content of each website was written, edited, and published by a select group.

The concept of website ownership was strong, and website owners were responsible for the content of their websites. Users who accessed such websites could not participate in the creation of the site's content and were not very active because they were generally used for reading purposes. Web 1.0 is a

website that readers can use to base their reading, but no changes can be made to it. In the early days of the web, technical skills were required to publish information online because, by reading, there were effective limiters for users who could write such HyperText Markup Language (HTML).

With the development of Web 2.0 technology, these difficulties have been overcome. Web 2.0 is the continuation of Web 1.0, and it is a network platform that can connect with all available devices, regardless of which operating system they are using. The transition from Web 1.0 to Web 2.0, which represents the era of one-sided content sharing, is compared to the transition from black and white television to colour television.

Inactive internet users have now become content producers just by watching or reading what is shown to them. Web 2.0 has a feature that allows people to download and upload content from the web. People have progressed from being participants on the web to being creators of their own content. This new web coined the term “participatory web, “ enabling web users to transition from individual consumers to information producers.

2. MARKETING ACTIVITIES THROUGH INTERNET ADVERTISING

In 1979, Tom Truscott and Jim Ellis of Duke University created the concept of social media on a discussion platform called Usenet. Usenet is a system that allows one to send messages to internet users around the world. The use of the concept of social media with its current meaning began 20 years ago with Bruce and Susan Abelson, who established the first social networking communication website called Open Diary. Open Diary brings together people who write for online journalists to build communities.

Later, as the internet grew in popularity, its accessibility improved. People understood it better; hence, social networking sites with different names and features were formed, and the popular term referred to as social media emerged.

Social media is an online community in which members create personal profiles in order to share their opinions and thoughts, build a social and professional network, and maintain social bonds (Keating, Hendy, and Can, 2016). Social media can best be understood as the new type of group that follows most or all of the characteristics of online media (Mayfield, 2008).

3. ADVERTISING CONCEPT

The origin of the word advertisement comes from the Latin verb “advertere”, which means “to turn to a field” (Goddard, 2001). The primary purposes of advertising are to promote, increase awareness, and create a compelling message about the advertised product or service to the consumers. The success or failure of the advertisement depends on whether it creates the expected attitude and behavioural changes in the intended population with the desired information at the right time and the right price (Weilbacher, 2001). Advertising is the best way to connect with customers. It provides customers with information about existing brands in the market and helps with product diversity. Ads, which are a part of our daily lives, are significant for businesses (Kannan, 2013). Advertising influences the consumption of products by customers and affects the way customers view and feel about the product. Advertisements have a significant impact on purchasing decisions (Giri, 2015). It raises customer pricing awareness of consumers and provides them with the opportunity to compare products. Nowadays, consumers are communities that seek active information, and they prefer the most logical option that best suits them (Uusitalo, 2010).

In terms of marketing in this highly competitive environment, advertising is inevitable for businesses. Advertising effects are divided into two categories: mental processing and impressive. The cognitive processing effects are determined by memory, emotional reactions, awareness of the advertisement, awareness of the content of the advertisement or campaign, and advertisement interest. (Frazer, 2002).

4. ADVERTISING ON SOCIAL MEDIA

With the development of Web 2.0 technology, the widespread use of social media has affected every aspect of life and the marketing field. In addition to traditional media channels, social media channels are now seen as a marketing area. Advertising is the most common marketing tool, and it is also the most efficient. Social media advertising has provided marketers with a new platform to improve brand awareness and perception. (Wei et al., 2010). The impact of ads on social media can spread in a short time. This is because the ad is visible on the page, but users can see that their friends use the marketed product or like the page and may refer to the advertised topic from a reliable source. This can increase the click-through rate of the advertised product or page and shorten the time to reach the target.

4.1. Advertising on Facebook

The marketing methods used on Facebook consist of Facebook ads, pages, groups, and applications. Facebook has turned into an area that the advertising industry cannot ignore, with the opportunity to create fan pages for brands and companies within site, publish advertisements on the page according to users' profile information, and be a very suitable medium for viral campaigns. Companies may effectively promote to their target audience thanks to Facebook's sharing of user information with advertisers via its Facebook ad program.

Small-budget businesses can reach their target audience on Facebook due to the low cost of advertising compared to traditional media tools. A study conducted to measure the efficiency concluded that Facebook ads could reach large audiences with small budgets. Their targeting feature allows many kinds of campaign options to be created according to the target audience. It has been determined that it offers a very favourable position in comparison to traditional advertising campaigns, which require high costs to reach large audiences. The profile page, often known as the user's home page on Facebook, is a user-owned section where anyone with a Facebook account has information that they want to share with their friends.

Pages are areas that enable individuals or organisations to interact with their fans or customers on Facebook. If the user likes these pages, they become a "follower" and can follow the shares of the page in their news source as a time clip. The main difference between groups and pages is that groups are generally set up by fans to connect with brands or individuals. In contrast, individuals or organisations set up pages to communicate with consumers. The advertiser has complete control over their Facebook ads. They can choose either the cost-per-click (CPC) method or the charging-per-view (CPM) method.

4.2. Advertising on Twitter

Facebook, where users can transfer all kinds of content, is more valuable and participatory than Twitter. Twitter, which has politicians, journalists, and celebrities among its users, cannot contribute significantly to sales other than gaining digital marketing prestige. Twitter is seen as a medium where many brands can promote themselves through promoted advertising applications. Sponsored advertisements appear in the Twitter stream and the

“who should be followed” list.

Twitter, which has weaker marketing methods than Facebook advertisements, continues to diversify advertising channels.

5. ADVANTAGES AND DISADVANTAGES OF INTERNET ADVERTISING FOR SOMALI BUSINESSES

The factors that make internet advertising more robust are its low cost, fast dissemination, up-to-date information, realisation in an environment where sincerity is essential, opportunity to know the target audience, ability to measure, evaluate, and analyse performance, providing interpersonal closeness through direct communication, and the reliability of the information received through reference. Internet advertising also enables companies to promote new content, and it demonstrates how closely consumers monitor companies. Firms that provide feedback on their sites boost consumer loyalty with their customers and strengthen their relationships, increasing the consumer’s commitment to the company (Weinberg, 2009).

Although internet advertising is the most popular topic, studies on internet advertising and social media, in general, are still in their infancy (Mansour, 2016). Many people are not unaware of the inherent risks associated with social media platforms, and in general, social media content is not under control.

Everything is under discussion on social media. The brand name can be tainted on social media without a link, and negative comments can damage the business (Sweeney & Craig, 2011). It has assessed the ability of social media customers to be more aware of the different ways of researching, selecting, and providing better service. Recent studies have revealed that customers want to participate in the product development process actively and want production to be tailored to their needs. This requires businesses to follow a more careful process and act in this direction.

6. LITERATURE REVIEW

In Hüseyin Şenkayas (2018) study, he examined the effect of internet ads on consumer behaviour. Today’s increasing internet use has pushed the advertising industry to the internet environment.

The internet environment acts as a more accessible tool between the product and the consumer. In this respect, the internet has become the shining medium in the advertising industry. When the statistical analysis results are

evaluated, it has been concluded that internet advertisements are an excellent tactical strategy in terms of marketing and competitive abilities. It is clear that those who rely on online marketing have an opinion about brands and products they do not know as a result of access to information and that they can use this information to make a purchase decision. It is reasonable to conclude that the entertaining feature of online advertising is directly related to the rise in demand for the advertised goods or services.

Lütfiye CAN and Ayhan SERHATERİ (2016) investigated the effects of social media ads' effects on brand attitudes. Since Facebook is the most popular social media platform, the study was applied to Facebook users. As a result of their regression analysis, it was revealed that the relationships between the informativeness of social media ads, the visual design of the ads, the perceived behaviour, the effect of awareness by the immediate environment, and the attitude to explain the empathy towards social media ads were significant. They found a meaningful relationship between the attitude towards explaining empathy and the attitude towards the brand. It was investigated whether brand attitudes differed based on demographic variables, and it was found that there was no significant difference.

Muhammet Altındal (2013), in his study titled "Brand Management and Social Media Effects in Digital Marketing", focused on the effects of social media, which can be used as the fastest and closest interaction tool to the customer in the new economy, where the consumer profile is awaiting the fulfilment of their requests to buy the products offered to them. As a result of his study, social media can be considered successful in terms of reaching people. However, it has come to the conclusion that it cannot be evaluated sufficiently in terms of converting to sales, which is the purpose of marketing.

Sabahattin CELIK (2014), in his article, Facebook, Twitter, blog, etcetera, is called social media. He put forward theoretically the relations between social media and marketing communication elements such as advertising and public relations. As a result of the study, the rapid growth of online communities and the online participation of community members give businesses many opportunities for marketing communication. Social media also referred to as "new media", brings new marketing communication tactics. Today, businesses are entering online chat environments to enhance and so-

lidyfy their strategic insight. They create a page on Facebook and get in touch with millions of fans, sell virtual products, purchase virtual places in virtual worlds, have their customers shoot new commercials as amateurs. At the same time, the chairmen of the companies write comments on the bloggers' pages and answer the questions asked about them in the forums.

7. METHOD

This study reveals internet advertising, which has become an essential advertising strategy in Somalia and worldwide. The development of internet technologies has opened up new options for internet advertising. For this reason, a web-based survey has been created.

The most important reason for creating an electronic survey is that it will be distributed via social media. Because the research sample will consist of social media users, only those who have seen a social media advertisement will be selected. For this purpose, 250 questionnaires were distributed through social media, and data analysis was done with 250 questionnaires.

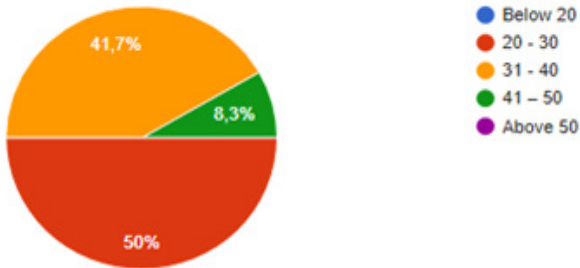
The following items were included on the questionnaire form used in the study: -

- The average age of the participants.
- Occupational distributions.
- For what purpose is the internet mainly used?
- The frequency of encountering types of internet advertising.
- What is the internet advertising application that most annoys you on the internet?
- What type of internet advertisement attracts their attention the most in the internet environment?
- Whether they have made purchases through advertising on the internet until the time of the survey.

It aimed to perform a sizing analysis of the satisfaction levels of internet advertising in general and an assessment of the feedback given on internet advertising.

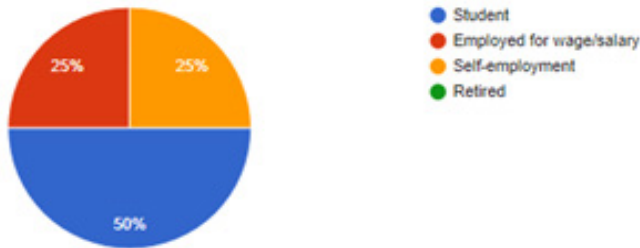
8 RESULT

The average age of the participants in the research



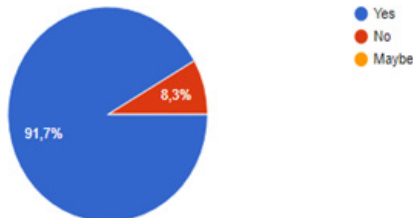
Considering the average age of the participants who contributed to the research, 50% of them are between the ages of 20–30 and 41.7% of those between the ages of 31–40, which shows that young people spend more time on social media. This was an expected result because it was not difficult to keep up with this system for the Y generation, who started using technology while growing up. Many Somali youths follow technology closely, learn and start using new devices immediately. It is a bit more difficult for those in the X generation, who find it difficult to understand new technology. Therefore, their participation in this study was 8.3%.

Occupational distribution of the research participants



The fact that the majority of the contributors to the study are 50% students can be associated with the average age because when analysing the average age of the participants in the study, it was found that 50% of them were between the ages of 20-30. It shows that young people continue their student life, particularly university students, continue to live their student lives.

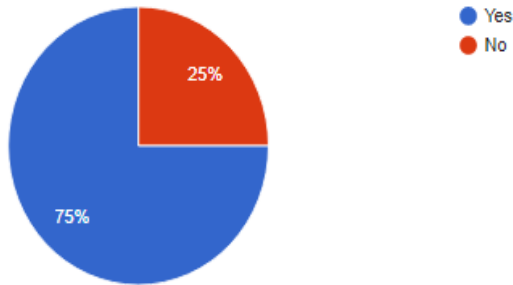
General analysis about internet advertising



Rapidly developing interactive communication processes have further increased the interest of Somalia companies in online advertising. As a result of the developing technologies, changes have started to occur in both the marketing and advertising strategies of companies and the consumption habits of consumers. Internet advertising differs from traditional advertising in that it has the capacity to reach more people.

When the participants in this study were asked if they believed in online advertising, they answered yes with an interestingly high rate of 91.7%. This high rate has been a happy and motivating answer for the current Somali companies in the market, to those starting to use internet advertising technology to increase their profits and companies that want to enter the market with a new business idea.

The importance of internet advertising for Somali businesses



With digitalisation, consumers have started to use e-commerce sites more frequently for shopping in Somalia and around the world. It is evident that this habit will become more widespread in the next few years, and the e-commerce market will grow even more. Seeing the development in this area, many entrepreneurs around the world direct their investments to the e-commerce sector.

When asked about the importance of internet advertising to the survey participants, their answers show that internet advertising is essential for Somali businesses, with a 75% result.

The number of newly established e-commerce companies in Somalia is still minimal. Still, regular companies have decided to sell their goods and services on the internet while the old sales methods continue.

It is possible to say that young people want to invest in e-commerce in Somalia. Still, the amount of capital they have is not enough, so they make small investments and make sales through the pages they open on Facebook or Instagram.

On the other hand, some young people do not have the capital to invest in e-commerce, so they usually make agreements with big companies to sell the company's goods and services on the pages they open on Facebook and get a commission per sale from the company.

9. CONCLUSION

Today, thanks to the developing technology, it is no longer possible to predict the impact area of social media. It has changed people's lifestyles and reflected its impact on many areas. The way people communicate with each other has changed, and the process of spreading information has accelerat-

ed. In addition to these changes, internet advertising has brought together the mass of people that they want to reach, companies and marketers they could not reach before. Companies can create pages for themselves on social media as well as increase their influence by posting advertisements that social media users can incidentally see (Blossom, 2009). Due to the increasing importance of online advertising, this study was conducted to determine the effect of internet advertising on Somali businesses. As a result of the analysis made, the following conclusions were reached: -

The number of newly established e-commerce companies in Somalia is still minimal. Still, standard companies have decided to sell their goods and services on the internet while the old sales methods continue.

When the participants in this study were asked if they believed in online advertising, they answered yes with an interestingly high rate of 91.7%. This high rate has been a happy and motivating answer for the current Somali companies in the market, to those starting to use internet advertising technology to increase their profits and companies that want to enter the market with a new business idea.

With digitalisation, consumers have started to use e-commerce sites more frequently for shopping in Somalia and around the world. It is obvious that this habit will become more widespread in the next few years, and the e-commerce market will grow even more. Seeing the development in this area, many entrepreneurs around the world direct their investments to the e-commerce sector.

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TURKEY'S INTERESTS IN SOMALIA

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ABSTRACT

This study examines Turkey's policies in Somalia, and it's guided by the conceptual framework composed of national interest and analysis of foreign policy. The research employs qualitative methods of data collection, and it collects data mainly from official documents and speeches of political leaders. This study finds that Turkey has historical relations with Somalia and has significant interests in the country. Turkey's Justice and Development Party(AKP) government has paid great attention to its increasing political, economic, and social ties with Somalia. Growing diplomatic relations between Turkey and Somalia pave the way for increasing their economic and trade relationship. Turkey has been developing its economic and trade ties with Somalia by diversifying its foreign policy.

The study also finds that Ankara, the former capital city of Turkey, implemented a policy to strengthen its geostrategic position in Somalia. Furthermore, Somalia required Turkey's assistance as well. Hence, Turkey has been launching developmental projects across the country in areas such as education, health, transportation, agriculture, infrastructure, and security sectors, contributing to the rebuilding process of Somalia. Turkey helped Somalia's stabilisation and reconciliation efforts by providing necessary aid. In this context, the Turkish government played a mediation role and hosted reconciliation talks between the Somali government and Somaliland. This study suggests that it would be in the best interest of Turkey to continue assisting Somalia. In exchange, the Somali state will be able to help Turkey in the pursuit of its interests. Therefore, Turkey should assist in the resolution of the Somali conflict and the state-building process.

Keywords: Turkey, Somalia, national interest, economic ties.

1. INTRODUCTION

The Republic of Turkey is an economically and politically rising regional power. Its influence in the Middle East, the Balkans, Central Asia, and the African continent is growing. In addition, it is interesting to observe that, despite there being no colonial history with African nations, Turkey-Africa relations can be traced back to the Ottoman period. Turkish-Somali relations can be dated back to the 16th century when the Ottomans aided the Somalis in fighting against the expeditionary forces of the Portuguese. As a result, Somalia initiated its diplomatic mission in Ankara in 1976, while Turkey began its first diplomatic mission in Mogadishu in 1979. Turkey's relations in Somalia served the country until the Somalian Civil War began in 1991.

Turkey has become actively engaged in Africa since the rise of the Justice and Development Party (AK Party) to power. It introduced the policy of the "African initiative", which focuses on humanitarian, economic, and security assistance to Somalia. Moreover, Turkish interest has focused on contributing to political and financial stability in Somalia within the framework of the Strategic Development of Economic Relations with Africa.

Turkey intends to expand its influence on the continent not only in terms of trade volume but also in terms of humanitarian aid projects. In 2011, then-Turkish Prime Minister Mr Erdogan (now the president), some ministers, and several affiliates of Turkey's cultural and commercial elite visited Somalia. Their visit provided moral support to Somalis who were experiencing food scarcity. In addition, Mr Erdogan became the first leader who went to Somalia in the last two decades. In 2011, Turkey became the first nation among the European and Asian countries to assign an emissary to Somalia after the collapse of the central government in 1991. Thus, this study examines Turkey's interests in Somalia. It tries to answer the following questions: -

1. Why does Turkey want to stabilise the Somali state?
2. How would Turkey's humanitarian, economic, and security relations with Somalia help achieve its interests?
3. What is the outlook of the Somali elites on the interest of Turkey in Somalia?

2. CONCEPTUAL FRAMEWORK

This study investigates Turkey's role in Somalia. The conceptual framework guiding this study is based on the role of national interest, with reference to Turkey's role in Somalia.

2.1 National Interests

National interests are a significant concept in international relations. All states are constantly involved in the process of fulfilling or establishing their objectives in the national interest. Every state aims to advance and broaden its national interests. According to Van Dyke, national interest is one that states hope to secure or accomplish in collaboration with other nations. Therefore, national interests are divided into three categories: core interests, middle-range interests, and long-range interests.

2.1.1 Core Interests

Core interests are those that must be accomplished at all times. These include independence, national security, regional integrity, and the welfare of the people. The principle of protecting Turkey's autonomy and regional integrity within its constituted borders, as well as anticipating strength and battle in relation to its interests against external threats, are critical values that should be part of Turkey's national interest. Therefore, the nation's foreign policy should always be focused on defending its core interests.

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2.1.2 Middle-Range Interests

Middle-range interests, such as economic growth and social development, are less urgent and require collaboration from states. The financial circumstances of a nation decide the status of its global field. Turkey implemented “the Strategic Development of Economic Relations with Somalia”, which became a strategic policy for the continent.

2.1.3 Long-Range Interests

Long-range interests are the slightest prompt. They relate to the state’s long-term interests and are the subject of very deliberate alteration. Leaders have sufficient time to determine their progress and accomplish these goals.

3. ARGUMENT

The Somali state collapsed in the 1990s. Many attempts have been made to revive it, but they all failed. The question is whether Turkey will be able to stabilise and revitalise Somalia. This study argues that Turkey, like any other state, seeks to pursue its interests, and a more potent, more stable, and inclusive Somali state will help Turkey achieve its objectives. Furthermore, this study assumes that Turkey is interested in transforming Somalia into an inclusive and sound condition.

4. METHODOLOGY

4.1 Research design

This research is qualitative. It gathers non-numerical data and aims to interpret meaning from these data so that the researcher can better understand social life by studying target populations or places. It is used to improve an understanding of fundamental reasons, ideas, and motivations.

4.2 Data Collection

In order to examine Turkey’s interests in Somalia, the data for this study will be collected from primary and secondary sources.

Primary sources such as official documents, agreements signed between the two countries, commentaries, and official speeches were gathered, studied, and analysed.

Ibid., p. 111.

Paul Seabruy, “Power, Freedom and Diplomacy: The Foreign Policy of United States of America”, New York Random House Inc, (1963), p. 83.

On the other hand, secondary sources included books, journal articles, newspaper reports, articles published by various international agencies, correspondence, photographs, and diaries from the internet.

It is expected that the multitude of sources of information will provide a complete understanding of the subject matter and will be of great support in delivering significant results in this study.

4.3 Data Analysis

The paper adopts an interpretive analysis approach. Interpretive researchers view social reality as part of social settings in which they interpret reality through a sense-making process rather than a hypothesis-testing process. An interpretive analysis is a technique for making inferences through systematic analysis of written documents or recordings of verbal messages.

5. TURKEY'S INTERESTS IN SOMALIA

Turkey's interests in Somalia are political, economic, and military. However, before discussing Turkey's interests, diplomacy and political interests will be considered first.

5.1 Diplomacy and Political Interests

The first official contact between Turkey and Somalia occurred on the 29th and 30th of January 2007, when the former Turkish Prime Minister, Mr Erdogan, attended the African Union (AU) Summit in Addis Ababa. At the summit, Mr Erdogan met with Somali President Abdullah Yusuf Ahmed and requested that he submit a proposal to Ankara addressing Somalia's issues and needs. Hence, the former Transitional Federal Government (TFG), President Sharif Sheikh Ahmed, made three visits to Turkey before Mr Erdogan paid his first official visit to Somalia in August 2011. However, the first Turkey-Somalia conference was held in Istanbul from 21st to 23rd May 2010, and the Istanbul Declaration was adopted at the conference. The UN General-Secretary and high-level representatives of international organisations took part in this conference.

It is important to note that Turkey appointed Mr Cemalettin Kani Torun as the Turkish ambassador in Somalia. Mr Erdogan highlighted that the primary purpose of Turkey's involvement in Somalia included: (1) strengthening historical relations, (2) alleviating the humanitarian crisis, (3) rebuilding

the country, (4) restoring peace and security in the country, (5) attracting the attention of the most significant drought in the world, and (6) contributing to peace and security in the region. President Erdogan emphasised that “regardless of which culture we come from or where we live, I am confident that our common heritage as human

⁶Tbid

beings will motivate us to ease the suffering of Somalia”. . On May 26, 2012, Turkey organised a Somali Civil Society Groups meeting in Istanbul, and more than 300 representatives from Somalia attended this meeting. The representatives discussed existing problems surrounding Somalia and its future. The Second Turkey-Somalia conference was held in Istanbul from 31st May to June 2012 under the theme “Preparing Somalia’s Future: Goals for 2015”. President Erdogan opened the largest and most advanced Turkish embassy in Africa on June 3, 2016, in Mogadishu, the capital city of Somalia. In December 2018, the Istanbul conference explored Turkey-Somalia and East Africa partnerships as the theme of the “East Africa Development Forum.” An annual conference in Istanbul aims to push for groundwork for high-level collaboration on future Somali-Turkish ties by pursuing non-African outlooks in an effort to clarify misunderstandings and add new perspectives on the new Turkish strategy towards East Africa. The core of Turkey’s diplomatic efforts in Somalia is to stabilise the war-ridden country. Hence, Turkey’s strategy for stabilising Somalia is due to its geostrategic significance in Turkey’s foreign policy, which will be discussed in the following section.

5.2 Geostrategic Interests

Turkey aimed to broaden its influence and strengthen bilateral relations with Somalia and other African countries. Turkey stated this as a win-win situation and that Somalia is a component of this policy. Besides, Somalia has the longest coastline in the Indian Ocean, a significant sea route through which more than 20,000 ships pass yearly. Somalia has some resources that would make it a promising partner in the long term. It strategically sits on the Gulf of Aden, just at the entrance of the Red Sea and the Suez Canal, a pivotal global shipping lane connecting the Mediterranean Sea to the Indian Ocean , as indicated in figure 5.

This sea route is crucial to the world economy, accounting for 20% of glob-

al yearly exports as of 2012. Turkey recognised Somalia's strategic location along some of the world's major shipping lanes and saw opportunities to build seaports and other transportation infrastructure

Erdogan, R.T, "The Tears of Somalia", (2011). 18 May 2015

, [http://foreignpolicy.com/2011/10/10/the-tearsof- Somalia](http://foreignpolicy.com/2011/10/10/the-tearsof-Somalia).

Kagwanja, C., "Turkey in Somalia: building relations using brotherhood, aid and dialogue", Africa Policy Institute, (2013), pp. 1-5.

Elsergany, R. "Erdogan Visits Famine-Hit Somalia, 2011", islamstory, (May, 182015, [http://islamstory.com/fr/ node/31273](http://islamstory.com/fr/node/31273)).

"Istanbul conference explores Turkey-Somalia, East Africa partnerships", Hiiraan Online, (2016), https://www.hiiraan.com/news4/2018/Dec/161380/istanbul_conference_explores_turkey_somalia_africa_partnerships.aspx

İpek, V, "2011 Landing Of Turkey on Somalia: The "State to People", Aspect of Turkish Foreign Policy towards Sub-Saharan Africa. European Scientific Journal, (2014), pp. 412-428.

Ibid.

Furthermore, Turkey's experience with Somalia will significantly impact its broader African agenda. It was argued that Turkey's interests in Somalia recognised Turkey as a "political" role in Africa and expanded its policy into a more complex and multifaceted one. It also assumes that Turkish engagements in Somalia have been effective, contributing to both Somalia's recovery and Turkey's status as an emerging global player.

Figure 1: Geostrategic map: Maritime Chokepoints in the Middle East



Sources: <https://geopoliticalfutures.com/us-cares-somalia/>.

5.3 Economic Interests

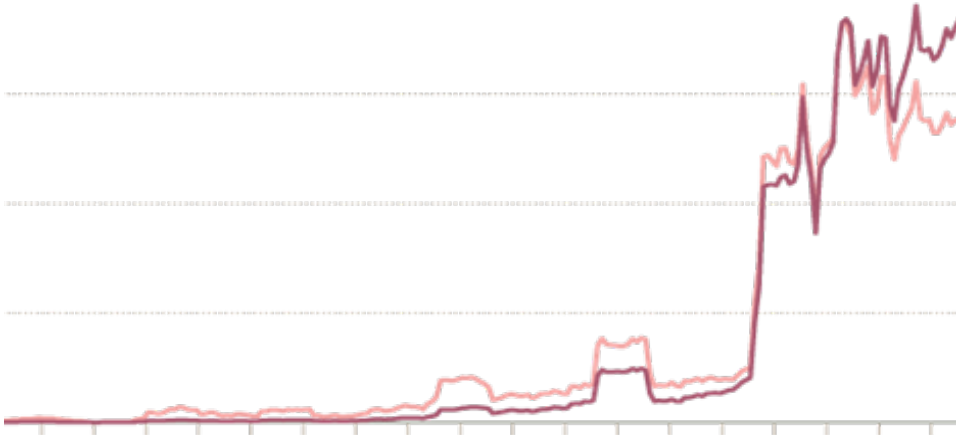
Ankara focused its efforts on the key economic sectors with high potential for growth and development with the Somali government, and these economic growth sectors included fishery, agriculture, and education. In addition, since 2011, Turkish governmental institutions and non-governmental organisations (NGOs) have provided technical support to their counterparts in Somalia. Turkey's total trade with Somalia in 2001 was only US\$516,000, and when the AK Party came to power in 2002, the nature of economic relations between Turkey and Somalia had changed. While Turkey's trade relations with Somalia were US\$6

13“Turkish warship joins NATO on piracy mission in Somalia.” Hurriyet., (15 October 2008). <http://www.hurriyet.com.tr/turkish-warship-joins-na-to-onpiracy-mission-in-somalia-10129712>.

Ibid. ,p. 90

million in 2010, they reached US\$42 million in 2011, then peaked at US\$70 million in 2015. As shown in figure 6, economic relations between the two countries have increased.

Figure 2: Somalia's Imports from Turkey



Source: Laura Pitel, “Somalia reaps rewards of Ankara’s investment”, *Financial Times*, (2016), <https://www.ft.com/content/bae31b04-fa6f-11e5-8f41-df5bda8beb40>.¹⁵

According to reports indicated in table 2, Turkey’s trade with Somalia in 2001 was US\$198 million in export values and US\$318 million in import values. Turkish companies began to operate strategic trade entities in Somalia. For instance, the Turkish company Albayrak started to operate the largest international airport in the country in 2013, and they have been operating the largest seaport in Mogadishu since 2014.

¹⁵Ibid., p. 23.

¹⁶Daly, J. C. K. “Turkey’s Undersea Marmaray Railway Tunnel Unites Europe, Asia”, *Jamestown*, (2015), [http://www.jamestown.org/single/?tx_ttnews\[tt_news\]=41551&no_cache=1#.VfgHZn1EyM8](http://www.jamestown.org/single/?tx_ttnews[tt_news]=41551&no_cache=1#.VfgHZn1EyM8).

Table 1 Turkey's Trade with Somalia (2001-2017) (1000 US Dollars)

Year	Export	Import	Total
2001	198	318	516
2005	2,207	839	3,562
2010	4,810	1,361	6,171
2011	39,548	2,465	42,013
2012	43,788	1,165	44,953
2013	58,315	1,052	59,397
2014	62,119	1,523	63,642
2015	71,035	1,343	72,378
2016	115,882	2,156	118,038
2017 (Jan-May)	52,238	145	52,384

Source: Turkish Ministry <https://www.economy.gov.tr/portal/ShowProperty?nodeId=%2FUCM%2FEK-152442>. of Economy, (2017), Turkish President Recep Erdogan opened the 6th high-level partnership forum in Istanbul on February 23, 2016. Somali Prime Minister Omar Abdirashid Ali Sharmarke said that Turkey had been an essential ally in terms of investments and that investors were drawn to Somalia because of its rich natural resources and human resources. Turkey and Somalia signed an agreement in February 2018 to strengthen their strategic economic partnership. Prime Minister Recep Erdogan stated, “We hope to expand relations with Somalia. Turkey’s investment in Somalia is more than US\$100 million.” In 2016, Recep Akdag anticipated that the two-sided trade volume would increase from around US\$120 to US\$200 million. Recep Akdag added that both countries should implement the 2016 memorandums of understanding

¹⁷Erdogan, R.T, “The Tears of Somalia”, (2011). 18 May 2015, [http://foreignpolicy.com/2011/10/10/the-tearsof- Somalia](http://foreignpolicy.com/2011/10/10/the-tearsof-Somalia).

in fields such as energy, electricity, higher education, agriculture, and maritime affairs during a signing ceremony.



Turkish Deputy Prime Minister Recep Akdag (C-R) and his Somalian counterpart Mahdi Mohammed Gulaid (C-L) sign the Turkey-Somalia Joint Economic Commission meeting protocol at the Ministry of Economy in Ankara.

Somalia participated in the Turkey-Africa Trade Forum in Istanbul in 2018. The assembly between Turkey's Trade Minister, Ruhsar Pekcan, and Somalia's Minister for Commerce and Industry, Mohamed Abdi Hayir Maareeye, made agreements to further invest in the trade. Their relations managed to boost each other's revenues.

¹⁸Ibid.

¹⁹"Somalia participates in Turkey-Africa Trade forum – makes investment agreements", Embassy of Somalia Ankara, (October 10, 2018), <http://www.somaliembassytr.com/news/somalia-and-turkey-to-increase-bilateral-investment/>.



Somalia's Minister for Commerce and Industry Mohamed Abdi Hayir alongside his Turkish counterpart, Trade Minister Ruhsar Pekcan.

Trade Minister Ruhsar said, "We know there is attention from our part on lemon and banana importation from Somalia, but this will be fulfilled once the ground is officially established." In January 2020, Recep Erdogan explained that Somalia welcomed Turkey to investigate for oil in its waters and that Turkey would make strides in line with the Somali invitation. "There is a proposal from Somalia". They are saying, "There is oil in our seas. You are doing these activities with Libya, yet you can likewise do them here. This is vital for us, and consequently, there will be steps that we will take in our operations there".



²⁰Ibid.

5.4 Military and Security Interest

Turkey's deepening commitment to Somalia managed to bring visible improvement to the war-ravaged country in segments ranging from health to infrastructure, education, and trade. Keeping peace and security is essential for economic and social development. It can be said that without sustaining peace and security in Somalia, Turkey's contribution to Somalia in different fields would not make much sense. Hence, Turkey played a vital role in maintaining its peace and security. There had been a security vacuum in the country for a long time due to the lack of a strong national army and police mission.²¹

In 2017, Turkey established its most significant foreign military base in the Somali capital, Mogadishu, boosting Ankara's presence in the Horn of Africa and the continent. The United Nations permitted the ground. In August 2017, the first batch of Turkish military personnel arrived in Mogadishu and began their first training program for the national army. The training camp building started in March 2015 at the cost of US\$50 million. Foreign Minister Yusuf Garaad Omar said, "This military training camp was set up by our Turkish partners and will be the first professional training camp for the Somali army. That is why it is very significant to us".²²



Turkey's President Recep Tayyip Erdogan, right, shakes hands with Somalia's President Mohamed Abdullahi Mohamed.

²¹"The State of the Humanitarian System: ALNAP Lessons Paper", Overseas Development Institute, London, (2012), p. 15.
Ibid., p. 29.

Turkey and Somalia agreed to strengthen their bilateral collaboration to defeat terrorism. Somali Prime Minister Hassan Ali Khayre stated that. “As the result of my visit, our two countries approved to have a strategic collaboration on security, combating terrorism, economic development, infrastructure, and businesses.” On October 28, Mr Khayre informed Anadolu Agency that “We also agreed on a project to generate jobs in Somalia through investment, and we hope that this will lead to growth in the country’s business activity.” As part of bilateral military and financial cooperation agreements, Turkey sent 12 off-road vehicles to Somalia in August 2020.



Turkey-Somalia agrees to boost bilateral relations.

On July 13, 2021, the first group of Somali female police officers travelled to Turkey for training in an effort to boost women’s participation in Somalia’s security sector. The chief of Somali police, General Hijaar, said that the female police trainees deployed to Turkey are members of the special police squad known as “Harmacad” and were chosen based on their educational qualifications.²⁴

²¹ZuhalDemirci, “Turkey, Somalia agree to boost bilateral relations”, Anadolu Agency, Ankara, (2017), <https://www.aa.com.tr/en/africa/turkey-somalia-agree-to-boost-bilateral-relations/950209>.

²²“First batch of Somali women police unit to train in Turkey,” somaliaffairs, (July 22, 2021), <https://www.somaliaffairs.com/features/first-batch-of-somali-women-police-unit-to-train-in-turkey/>

6. CONCLUSION

Based on the above discussion, it is clear that Turkey managed to set up new foreign policies toward Somalia. After Turkey’s successful operation in Somalia, Somalia re-entered the agenda of the international community after being left behind for two decades. For the first time since the cold war, Somalia can now decide on their own destiny and identify themselves as “actors”.

It can be said that the new interest discourse not only focuses on security and politics but also on economic opportunities. Somalia is the most crucial African country for strengthening Turkish foreign policy towards Africa. Turkish interest in Somalia helps to increase Turkey’s regional influence and enhances its international power in international politics. Continuity is essential for success in its foreign policy.

7. FINDINGS AND RECOMMENDATIONS

The following is the summary of the findings of this paper:

1. Turkey aimed to increase its influence and expand two-sided ties with Somalia. Besides, Somalia is located in a strategic position on the world map. Turkey recognises that Somalia lies along some of the world’s major shipping lanes, and they saw an opportunity to build seaports and other transportation infrastructure. Furthermore, the Turkish government was granted permission to build a military base in Somalia for the purpose of training Somalia’s armed forces. The ground might be used for other purposes in the future, such as deepening partnerships with other African military forces or defending its strategic interests. Somalia is Turkey’s gateway to Africa and will further provide economic and political access to the rest of the African countries.

2. Turkey had historical relations with Somalia, and therefore, it had vested interests in the country. These interests can be pursued through their historical connections.

3. Since the end of its humanitarian crisis in 2011, Somalia needed Turkey's assistance. Turkey began launching developmental projects across the country that covered its education, health, transportation, agriculture, infrastructure, and security sectors. This contributed extensively to the rebuilding process of Somalia. In addition, Turkey helped Somalia during its stabilisation and reconciliation operations by providing sufficient aid.

4. Somali elites had preconceived notions about Turkey's objectives in Somalia and its best interests in supporting Somalia. In return, Somalia's government will be able to assist Turkey in pursuing its interests.

Given the above findings and analysis, this study recommends that:

1. It is in Turkey's best interests to help Somalia. In exchange, Somalia's state will be able to support Turkey in pursuing its interests. Thus, Turkey should help to bring stability and attempt to resolve the Somali conflict.

2. Somalia is still undergoing tremendous development improvements as well as a peace-building effort. Nonetheless, despite the Somali government's ongoing struggles with fundamental fiscal issues, Turkey should continue to help Somalia's recovery process through soft power measures such as aid, diplomacy, infrastructure, and trade in order to achieve its interests in Somalia.

3. Strengthening the foundation of stability and peace in Somalia has resulted in the mutually beneficial collaboration that Turkey aims to see in Somalia. Together with Turkey, this will help the region improve as a whole. Turkey should play a mediation role between the FGS and other armed groups, such as the Islamist militant group al-Shabaab.

4. Somalia is located in a strategic position on the world map and is progressively seen by regional and international powers as a significant strategic asset. Many Middle Eastern states have started political and security engage-

ment with Somalia. However, Turkey, Qatar, and the United Arab Emirates are the most prominent amongst them. Therefore, Ankara should avoid the risk of becoming a battleground if there is an increase in rivalry between external powers. This needs to be avoided as it will cause more damage to the already fractured state.

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GENDER GAP IN TECHNOLOGY AND ENGINEERING IN SOMALIA: A CASE STUDY OF SOMALI INTERNATIONAL UNIVERSITY

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Iqra Mohamed Fidow

ABSTRACT

This research paper summarises the immense gender gap in engineering and technology in Somalia. Engineering and computer science are two of the well-paying STEM (Science, Technology, Engineering, and Mathematics) career fields that remain heavily male-dominated. Although the gender gap in math and technology courses has narrowed in recent decades, women continue to be underrepresented in the areas of engineering and technology because of the following factors: (a) fewer role models, (b) gender-related stereotypes and biases, (c) occupational interests or preferences, and (d) field-specific ability beliefs.

This study is quantitative research and an infinite population target sampling procedure that selects 155 respondent students who have graduated from universities in Mogadishu, Somalia, with the use of online web survey instruments called KoBo Toolbox. The data was analysed using descriptive statistical analysis.

Gender inequality in engineering and technology can be reduced by proper monitoring, adequate information, creating necessary work conditions and providing equal employment opportunities in these fields of engineering and technology to minimise field-specific ability beliefs.

Keywords: Gender Gap, Science Technology Engineering Mathematics (STEM), Stereotypes, Engineering and Technology.

1. INTRODUCTION

Gender differences in engineering and technology education participation are already visible in early childhood care and education, and they become more pronounced at higher levels of education. Girls appear to lose interest in engineering subjects with age, particularly between early and late adolescence, leading to decreased interest in pursuing engineering and technology studies at the universities. Engineering and technology education is vital to any nation's development, and no citizen deserves exclusion or limitations in being scientifically literate. Like other African nations, Somalia has a dire need to ensure equality in the participation of both its male and female citizens in engineering and technology education.

A recent article released by the European Commission expressed concern over the level of the technical skillset of people compared to the requirements of jobs that will be coming to fruition in the near future. This report is forecasted that approximately 825,000 information and communications technology (ICT) positions will be unfilled across Europe by the year 2020 (European Commission, 2015). With the unemployment percentage of women in Ireland at 8.3% (CSO, 2015), it is not a far stretch to see the benefits that could be gained from increasing the number of females in the technology sector and, as such, reducing the gender gap.

The majority of articles tend to focus on the lack of gender diversity within the likes of the financial sector. Still, as discussed, there seems to be lower gender egalitarianism within the high-tech industries. The following research will look at what is impeding so many women from entering or remaining in the technology sector and what can be done to help promote women within this sector. Companies are striving to promote a fair and equal workplace, and gender diversity is at the top of the list when it comes to equality. Organisations are promoting such diversity initiatives not only because it is the right thing to do but also because it grows out of countless studies that show gender diversity helps promote growth with productive competition, innovation, and increased depth of collective intelligence.

1.2 Problem Statement

The problem is that women are not an integral part of engineering and technology and that most women are not aware of the technology. Girls believe they are incapable of dealing with science and engineering because they are perceived as male domains by girls and boys. Girls might believe that women, in general, can pursue STEM careers, but not themselves. The belief in the capability of dealing with STEM and having the necessary skills for STEM is the fundamental need for developing preferences for that profession (Bamberger, 2014). The goal in education should be to convince women that they can play an essential role in engineering and technology.

Topic: The environment plays a larger role in making engineering interesting for females, as various environmental factors could readily discourage girls and women.

Gap: The unresolved problem is that women are not convinced that they can play an essential role in technology.

Evidence: The problem arises when degree studies analyse those numbers. There is a gender gap in science, technology, engineering, and mathematics (STEM), with a low number of women enrolled in those programs and even lower numbers of graduates. (Garcia-Holgado et al., 2020).

Research Aim: The researchers aim to attempt to understand the potential causes contributing to this gender gap, which is evident in the technology sector of the chosen study, and reveal actionable areas that may help reduce the gap in the future.

This study aims to explore the possible causes of the gender gap in Somalia, specifically in Mogadishu.

1.3 Purpose of the Study

The goal is to achieve equality for both men and women in technology and for women to be persuaded that they can participate in engineering and technology.

1.4 Objectives

The objectives of this exploratory research study are to:

1. Uncover if any internal or external forces could contribute to the gender gap evident within the engineering and technology sectors in Somalia, especially in Mogadishu.
2. Uncover why such a gap might exist and what, if any, macro-environmental forces influence it either positively or negatively.
3. Reveal actionable points that may help others lessen such a gap in the future.

1.5 Research Questions

1. To what extent is female participation in engineering and technology influenced by home factors?
2. To what extent is female participation in engineering and technology influenced by employment factors?
3. To what level is female participation in engineering and technology influenced by school factors?

2. LITERATURE REVIEW

2.1 Introduction

Female participation in higher tertiary education has increased rapidly over the past decades. Currently, about 56% of all students in the European Union are women, and this figure is still rising (Eurostat, 2010). Yet, this increase in female student participation does not apply to all academic fields. In mathematics, science, and technology (MST), where women have consistently been underrepresented, their participation rate has actually decreased over recent years, from 41% at the end of the 1990s to 38% in 2010 (Eurostat, 2010). The relative decline of women in MST is generally regarded as undesirable as it contrasts with European ambitions of achieving gender equality and a highly-skilled, innovative society (European Commission, 2007, 2008, 2009a, 2009b, 2010a, 2010b, 2012; Organisation for Economic Co-operation and Development [OECD], 2006a).

Whereas in the past, the unequal representation of female students in mathematics, science, and technology was explained as a result of the lesser aptitude of women for these subjects, thorough research in primary and sec-

ondary education shows that there is little empirical support for this claim (Barres, 2006; Ceci, Williams, & Barnett, 2009; Guiso, Monte, Sapienza, & Zingales, 2008; Haworth, Dale, & Plomin, 2008; Hyde, Lindberg, Linn, Ellis, & Williams, 2008; Lynch & Feeley, 2009; OECD, 2009, 2010; Spelke, 2005). Moreover, this explanation of presumed lesser aptitude cannot be used to explain the vast differences in female participation rates that exist between countries.

Fortunately, progress has been made in explaining gender differences in academic choice patterns along more sophisticated theoretical lines and new empirical methods in recent years. The availability of new comparative international data sets such as the Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS) has opened new opportunities for research into cross-national variation, and additional avenues for explaining gendered study choice have been explored. This article aims to present an overview of the recent literature, describe the state-of-the-art in explaining gendered study choice patterns, and critically assess recent scientific progress in this field. For this reason, the focus is on research published from 2005 onwards.

The central question the study will try to answer is, which types of explanations are currently given for gendered choice patterns in mathematics, science, and technology, and what are the implications of these types of explanations for designing further research in this field? To answer this question, the structure of the article is as follows:

First, the researchers will present the method of literature search and selection. Second, distinguish three main strands of literature based on micro-level, macro-level, and institutional perspectives. For each perspective, there will be a presentation of a summarised overview of the main theoretical frameworks on which recent studies have been based, as well as the results of these recent studies. Third, critically discuss the evidence provided from each perspective and point out some inconsistencies and lacunae. This discussion then leads to the formulation of recommendations for a more integrative approach, and the contribution ends with a brief conclusion.

Technology is a fast-growing industry, and as more women are graduating in recent years, it is evident that opportunities in this area are being overlooked. According to Buchmann and Diprete (2013), who conducted

a study within the US school system on American students, the number of female graduates had increased to 36% by 2010. It then surged again by 2013, to the point of outpacing men in college enrolment figures. It does find that the number of female graduates is low within the STEM fields. The research continues by discussing how women lose interest in STEM subjects at a school-going age, which deters them from pursuing further education in these areas.

2 Review method

The method used for this literature review consisted of six stages. The first stage involved conducting a broad search in electronic databases for references to academic publications on the topic. The databases included in the search were Web of Knowledge, ScienceDirect, International Bibliography of the Social Sciences (IBSS), Education Resources Information Center (ERIC), and Google Scholar. The databases were searched using combinations of key search terms such as gender, education, choice, science, mathematics, and technology.

Stage 2 was to select articles from the search results based on their timeline and status. For the timeline, papers published or accepted for publication from 2005 onwards were selected in order to provide a state-of-the-art review. On status, articles were selected that had appeared or had been accepted in peer-reviewed journals.

Stage 3 consisted of further selecting the articles based on titles, abstracts, and keywords. If it was unclear whether a study conformed to the screening criteria from the title, abstract, and keywords, it was included so that it could be subjected to a detailed assessment in the next stage. This resulted in the selection of 331 studies.

Stage 4 assessed the quality of each of these 331 studies by examining the full text of the paper. The quality was mainly evaluated using two criteria: rigour and credibility. With respect to rigour, the researchers examined the research design, data collection method, and analysis method, thereby respecting quantitative, qualitative, and mixed-method designs. For credibility, the researchers reviewed the presentation of the data, the discussion of the evidence, the limitations of the study, and the justification of the conclusions based on the results.

During stage 5, a grouping of the 155 remaining articles was made. This eventually distinguished three main analytical foci applied in these recent studies.

- A micro-level focus is mainly applied in the field of educational psychology, in which gendered choice patterns are explained using psychological constructs, that is, variables at the level of the individual student.
- A macro-level focus is primarily applied in educational sociology and gender studies, in which gendered choice patterns are explained as a result of societal characteristics.
- An institutional focus, in which gendered choice patterns are explained due to the characteristics of national education policies and systems. In the remainder of this article, the study refers to the distinction between these three types of analyses.

Finally, in stage 6, the three perspectives were subjected to an additional literature study to reach a more fundamental understanding of their conceptual cores. Books, articles, proceedings, and research reports from international organisations that had previously been published were included for this purpose. This also included references to the critical literature that formed the foundations of current research, such as Bandura's work on social cognition theory for micro-level studies (1977, 1978, 1982, 1986, 2001; Bussey & Bandura, 1999). Including these additional materials enabled this study to place recent research findings in the context of the literature they referred to.

This process resulted in three separate overviews presented in the following three sections. For each perspective, the researchers will first expound on the broader theoretical foundations and then submit the main research findings of recent studies conducted from that perspective. The study explores and analyses the factors influencing female participation in engineering and technology education in Somalia and their impact on the career aspirations of young people. The ultimate goal of the study is to provide a more comprehensive understanding of gender equity in engineering and technology. A lot of factors have been identified for the lack of interest by women in engineering and technology. Some of these, according to Akinsowon and Osisanwo (2014), include:

1. Individual interest: This is a relatively stable individual motivational dis-

position towards specific objects of interest and is characterised by increased attention and, in most cases, positive effects and emotions. The object of interest could be concrete or particular content, an event, or ideas. Individual disposition towards interest is characterised by the tendency of individuals to re-engage with an object of interest and thus represents a relatively stable person–object relationship. Thus, in the engineering and technology education context, interest means a student’s enduring nature to engage in engineering school subjects, representing objects of interest, such as physics and computer-related courses.

2.Stereotype threat: According to researchers, the mere perception that a group that one belongs to is not good at a task has been linked to lower academic performance. When girls become aware, through both subtle and overt cultural messages of male superiority in math, it makes each encounter with math and technology more fraught, triggering self-doubt in even the most studious young girls (Carly Berwick 2019).

3.Situational interest: The environment plays a more prominent role in making engineering interesting for females as various environmental factors could readily discourage girls and women, such as:

a.The teachers’ factor: The perceptions and attitudes of teachers teaching in schools may be discouraging, and this attitude often makes girls drop out of school. Teachers in some rural parts of Africa believe that boys will go to university to take courses like medicine, engineering, architecture, and so on. Girls will only study to become secretaries, teachers, and designers. This perception or attitude of teachers informs how they teach and attend to the girls in their classes, especially in mathematics and science, and these affect the girl child’s performance. On record, one out of every three women in the world is illiterate, meaning that boys are more likely to be in school than girls. Some facts show that teachers are more attentive to boys and offer them more opportunities for hands-on practical work, while the girls are mostly ignored or not given as much attention as the boys. For example, most of the textbooks used for STEM courses use boys as critical figures in depicting science and technology.

b.The home factor: Balancing family life and personal relationships while achieving a successful career in science is becoming a significant challenge for women. This has made some women forgo advancements in their careers

in order to devote time to raising families. The challenges of child care and the demands of running a research laboratory are often seen as incompatible. It appears that women who plan to have children in the future drop out of the academic research race at twice the rate of men. Women are also hit hard with family responsibilities just when they need to meet research goals (C. Ph.D. & C. Ph.D., 2017).

4.The capability to deal with STEM: Because science and engineering are perceived as male domains by both girls and boys perceive science and engineering as male domains, girls believe they are incapable of dealing with such subjects. Girls might believe that women, in general, can pursue STEM careers, but not themselves. The belief in dealing with STEM and having the necessary skills is the fundamental need for developing preferences for that profession. (Bamberger, 2014).

5.STEM career choice: Students' declarations on future career choices depend on gender identity. There is evidence that more boys than girls are willing to consider studying science and engineering in the future. Even girls, who believe they are capable of dealing with STEM, hold a view of the elimination of possibilities in these areas. Students make their decisions in order to conform to the traditional notions of man and woman, whereby science and technology are considered for boys as a masculine identity and girls as a not-feminine identity (Bamberger, 2014).

3.1 Introduction

This chapter will describe and explain the methodology of the study. It discusses the focus on research design, target population, sampling technique, sample size, research instruments, data collection procedure, reliability and validity of the instrument, data analysis, ethical considerations, and study limitations.

3.2 Study Area

Somali International University in Mogadishu, Somalia.

3.3 Research Design

- The study was conducted as a descriptive and cross-sectional study due to the short time frame for the study to be completed.
- The study utilised a survey design. Thirty-one undergraduate engineering and technology students at Somali International University in Mogadishu, Somalia, were the subjects of this study. A questionnaire was the instrument for data collection.
- The data was analysed using descriptive statistics.

3.4 Study Population

The target population of this study is students attending Somali International University in Mogadishu, Somalia.

3.5 Sampling Techniques

The number of students who study at Somalia International University is large. As a result, they cannot all participate in the study process because it consumes more time and money, so the researchers chose to include some of their students in the study.

The reasons for taking samples are the following:

- 1.It's less time-consuming.
- 2.It decreases the burden of the study.
- 3.It increases the quality of the study because it produces reliable information.

3.6 Sample Size Determination

Our study is quantitative research and uses an infinite population target sampling procedure. The study also determines the number of participants or subjects and selects 155 respondent students who graduated from universities in Mogadishu, Somalia. Using online Web survey instruments called KoBo Toolbox, data was analysed using descriptive statistical analysis.

3.7 Research Instrument/Methods of Data Collection

There are a lot of methods that every researcher can use to collect data from anywhere they want. They can apply the observation method, the interview method, the questionnaire method, and the checklist methods. This research will use the survey method to collect data.

3.8 Validity and Reliability

Validity: It ensures the correctness or quality of the questionnaire that is accepted by experts when they see the questionnaire.

Reliability refers to the consistency in reaching the same result when the measurement is made again and again. Or reliability is defined as “the extent to which a questionnaire, test, observation, or any measurement procedure produces the same results on repeated trials.”

3.9 Data collection techniques

Quantitative data analysis was used to analyse the data in this study. The researchers proceeded to fieldwork to collect data, and the data collection instrument was used for the survey.

The data was studied by analysing, classifying, tabulating, and displaying it in any format that allows for a thorough understanding.

3.10 Data Analysis

The data was analysed using descriptive statistics. The Statistical Package for the Social Sciences (SPSS) version 20 was utilised for the analysis. It is the most effective method of data analysis, which is why it is favoured for use and makes data analysis easier.

3.11 Ethical Consideration

The ethical issues that the study will consider are the following:

a. Informed consent: The study will focus on knowledge and attitude of gender gaps in technology and engineering students at Somali International University. This study will be voluntary if participants accept the researchers' consent. The researchers will invite the respondents to a particular place, and the survey duration will be 30 minutes. The researchers will ask questions, and some of these questions will be related to the participant's background. Others will be connected to their involvement in promoting the gender gap in technology and engineering. The survey will ask if there is any risk to the participants. Some questions will be sensitive, but it is not compulsory to answer. The respondents will not get any benefit, but the only benefit they will get is the opportunity to participate in promoting gender equality in technology and engineering.

b. Privacy: The respondents will be prepared with a special place to ask everything about the study.

c. Confidentiality: The researchers will promise that the respondents' information will be kept confidential and will not be passed to a third party.

3.12 Research Limitations

The significant limitations of this study are:

1. There is a language barrier that deteriorates the understanding of feedback to the questionnaire.
2. Cost.
3. Time factor.

4. DATA PRESENTATION, INTERPRETATION AND ANALYSIS

4.1 Introduction and Findings on Demographic Characteristics of Respondents

This chapter contains data presentation, interpretation and analysis.

Figure 4.1 Gender of the respondents

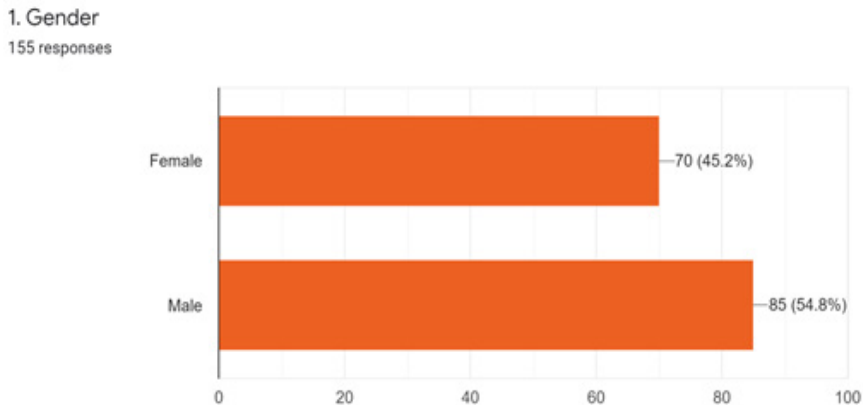
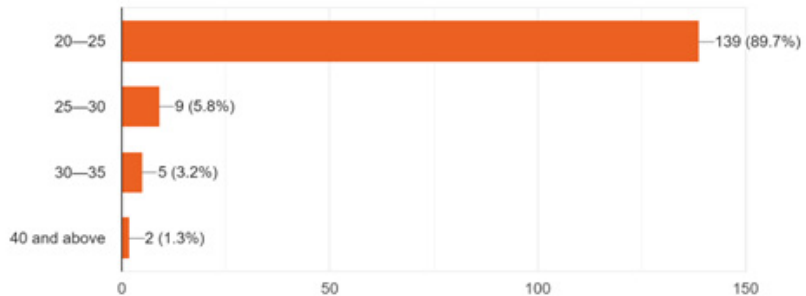


Figure 4.1 above indicates that 85 (54.8%) of the respondents were male, and 70 (45.2%) were female. This implies that most respondents were men because they are the ones who are usually more aware of using technological platforms. The researchers collected data using Google forms, which is hard for health and other faculty students to use, leading to the female gap in this study.

Figure 4.2 Age of the respondents

2. Age

155 responses



shows that 139 (89.7%) of the respondents were aged 20 and 25 years old, 9 (5.8%) were 25 and 30 years old, 5 (3.2%) were 30 and 35 years old, and the rest of the respondents were 40 years and above. This implies that those between 20 and 25 years old were students who studied at Somali International University (SIU).

Figure 4.3 Different faculties of the responded students

3. Faculty

155 responses

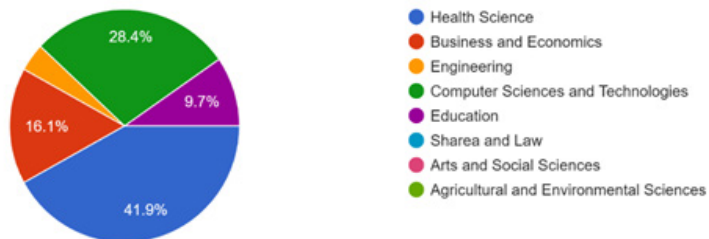


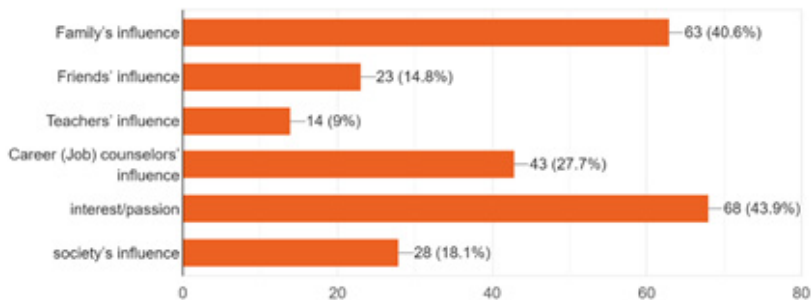
Figure 4.3 shows that 41.9% of the respondents were health science students, 28.4% of them were from computer science and technology, 16.1% were business and economics students, and the rest of the respondents were from other faculties of Somali International University (SIU). This suggests that most of the respondents were health science and computer science students, which indicates that most of these faculty students interacted with each other and may have shared the same campus.

4.2 Findings on influences of patriarchy Among Female Gap in Engineering and Technology Education

Figure 4.4 To which the following were important factors in your decision to study this faculty (If applicable, please choose more than one answer)?

4. To which the following were important factors in your decision to study this faculty (If applicable, please choose more than one answer)?

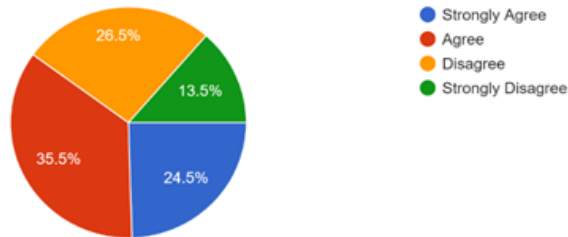
155 responses



The study presented in figure 4.4 above found that 68 (43.9%) of the students chose the faculties that they attended by their interest, 63 (40.6%) chose by their family's influence, 43 (27.7%) of them decided by their career, and the rest of the students chose by their friends' influence, teachers' influence, and social influence. This implies that the majority of the students agreed that they would attend the faculties of their choice. This suggests that females are uninterested in engineering and technology and that their families may persuade them to pursue other fields such as health science.

Figure 4. 5 Traditional perceptions that “a woman’s place” is not the engineering and technology field

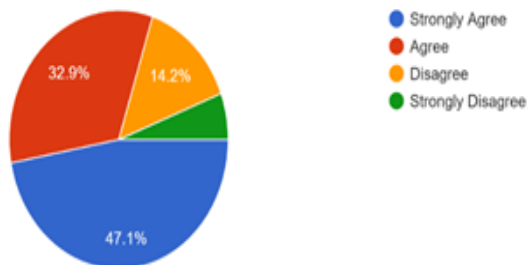
5. Traditional perceptions that “a woman’s place” is not the engineering and technology field
155 responses



The study findings presented in figure 4.5 above indicate that 35.5% of the students agreed, 26.5% disagreed, and 24.5% strongly agreed that traditional perceptions of “a woman’s place” are not in the engineering and technology fields. This implies that the majority of the students agreed with the statement, indicating that most of the students were aware of the gender gap and that parents, teachers, and community members needed to step up, support and encourage females to enter science, technology, and engineering faculties in order to change these perceptions.

Figure 4.6 Do you consider that boys study more than girls in engineering and technology faculties?

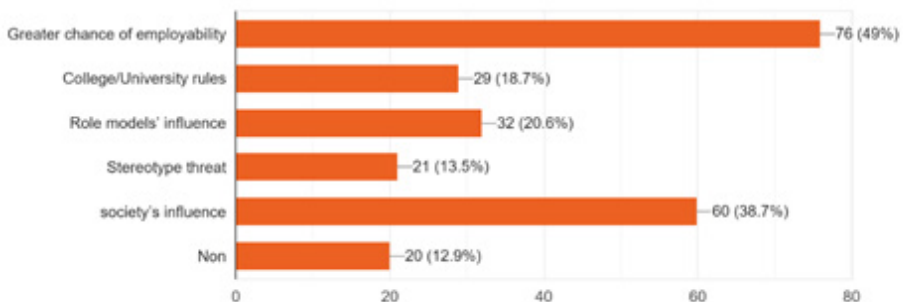
6. Do you consider that boys study more than girls in engineering and technology faculties?
155 responses



According to the survey findings provided in figure 4.6 above, 47.1% of respondents strongly agreed, and 32.9% agreed that boys study more than girls in engineering and technology faculties at Somali International University (SIU) and throughout the country. This indicates that most of the students were aware of the female gap in engineering and technology education due to various bottlenecks among them, such as societal perceptions.

Figure 4.7 If you agree which factors contribute to boys studying more than girls in engineering and technology faculties (If applicable, please choose more than one answer)?

7. If you agree which the following factors contribute to that boys study more than girls in engineering and technology faculties (If applicable, please choose more than one answer)?
155 responses

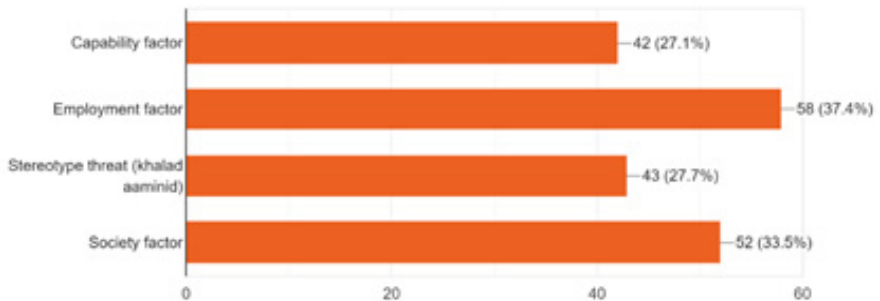


The study findings presented in figure 4.7 above indicate that 76 (49%) of the students strongly agreed that boys have a greater chance of employability than girls as a result of engineering and technology jobs in the market. 60 (38.7%) of the students also strongly agreed that society's influence challenges girls to attend the engineering and technology faculties. A majority of the students felt that society and the market's employability are the main factors causing the female gap in attending those faculties.

Figure 4.8 The following factors contribute to females' preference for other faculties than engineering and technology.

8. The following factors contribute that female prefer to other faculties than engineering and technology

155 responses



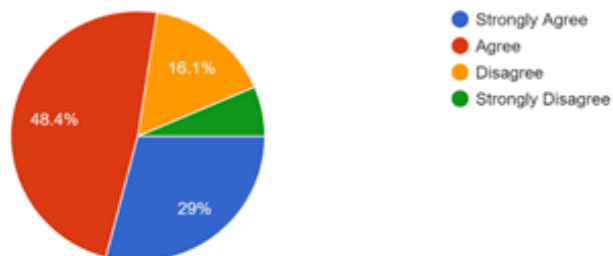
The study findings presented in figure 4.8 above indicate that 58 (37.4%) of the students showed an employment factor as the one that contributes to the female's preference for other faculties than engineering and technology faculties. 52 (33.5%) of the students presented that society's influence is a contributing factor, and the rest of the students presented that capability and stereotype threats are other contributing factors.

4.3 Findings on influences of workplace Among Female Gap in Engineering and Technology Education

Figure 4.9 Do you consider inequality in engineering and technology employment?

9. Do you consider that there are inequality in engineering and technology employment ?

155 responses

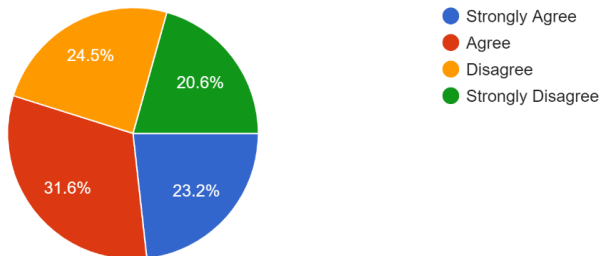


The study results presented in figure 4.9 above indicate that 48.4% of the respondents agreed, and 29% strongly agreed that there is an inequality in engineering and technology employment towards boys and girls when they graduate from the same faculties. This implies that most of the students agreed with the statement, which indicates that most girls prefer other faculties than engineering and technology because of inequality.

Figure 4.10 Engineering and Technology are more challenging for a female

10. Engineering and Technology are more challenging for a female.

155 responses

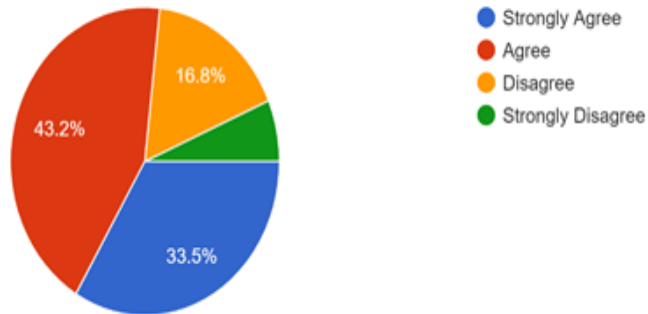


The study findings presented in figure 4.10 above indicate that 31.6% of the students agreed, 23.2% strongly agreed, and 24.5% disagreed that engineering and technology are more challenging for females than males. This shows that most of the students agreed with the statement, implying that the majority of the students had traditional notions of women or that there may be some circumstances, such as society, that drive them to believe that there is a form of challenge for female.

Figure 4.11 Do you believe that girls' employment significantly impacts Somali culture?

11. Do you believe that girls' employment has a significant impact on Somali culture?

155 responses

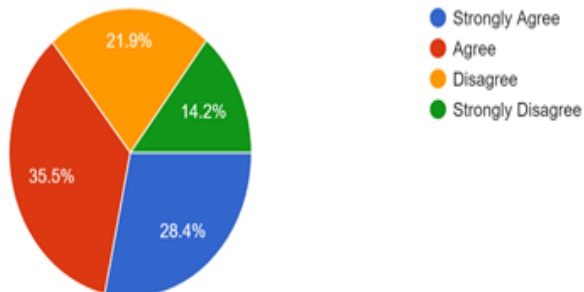


The study findings presented in figure 4.11 above indicate that 33.5% of the students strongly agreed, 43.2% of the students agreed, and 16.8% of the students disagreed that girls' employment has a significant impact on Somali culture.

Figure 4.12 Working environment in engineering and technology is more suitable for male than female

12. Working environment in engineering and technology is more suitable for male than female

155 responses

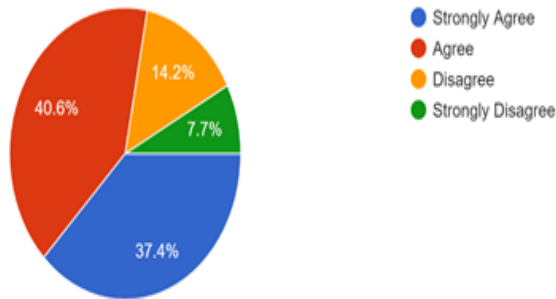


The study findings presented in figure 4.12 above indicate that 35.5% of the respondents agreed, 28.4% strongly agreed, and 21.9% disagreed that the working environment in engineering and technology is more suitable for males than females. This indicates that the majority of the respondents agree with the statement, which implies that most of the students had those traditional perceptions about the girls' capabilities

Figure 4.13 High priority opportunities are given for males than females in engineering and technology

13. High priority opportunities are given for male than female in engineering and technology work placements.

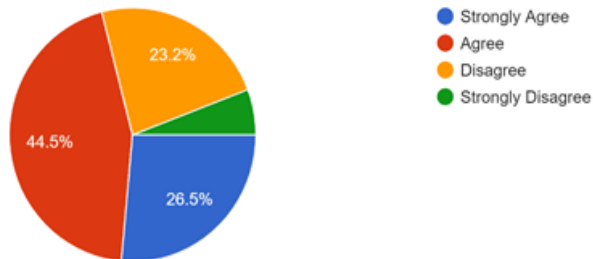
155 responses



The study findings presented in figure 4.13 above indicate that 40.6% of the respondents agreed, 37.4% strongly agreed, and the rest of the students disagreed that high priority opportunities are given to males in engineering and technology work placements.

Figure 4.14 Engineering and Technology females are given the resources and training to do the work

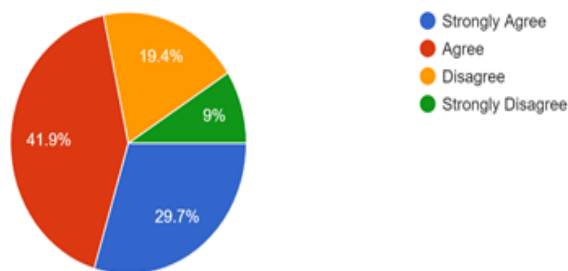
14. Engineering and Technology female are given the resources and training to do the work.
155 responses



The study findings presented in figure 4.14 above indicate that 44.5% of the respondents agreed, 26.4% of the respondents strongly agreed, and the rest of the students disagreed that engineering and technology women are given the resources and training to do the work.

Figure 4.25 Compared to males, are professional females sent by the organisation for training, skill advancement and empowerment every year?

15. Compared to males, are professional females sent by the organization for training, skill advancement and empowerment every year?
155 responses



The study findings presented in figure 4.15 above indicate that 41.9% of the respondents agreed, 29.7% strongly agreed, and the rest of the students disagreed that the organisation sends professional females for training, skill advancement, and empowerment every year

5. DISCUSSION OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction and Discussion of findings

This chapter contains a discussion of findings, conclusions and recommendations.

5.1.1 Demographic Characteristics of Students

The study revealed that 85 (54.8%) of the respondents were male, and 70 (45.2%) were female. This implies that most respondents were men because they are the ones who are usually more aware of using technological platforms, as data was collected using Google forms, which is hard for health and other faculty students to use. This led to the female gap in this study. It also showed that 139 (89.7%) of the respondents were between 20 and 25 years old, 9 (5.8%) were between 25 and 30 years old, 5 (3.2%) were between 30 and 35 years old, and the rest of the respondents were 40 years and above. This implies that the majority of the respondents were between 20 and 25 years old, which indicates that most of the respondents were students who studied at Somali International University (SIU). The study also showed that 41.9% of the respondents were health science students, 28.4% were from computer science and technologies, 16.1% were from business and economics students, and the rest of the respondents were from other faculties of Somali International University (SIU). This suggests that most of the respondents were health science and computer science students, which indicates that most of these faculty students interacted with each other and may have shared the same campus.

5.1.2 Influences of Patriarchy Among Female Gap in Engineering and Technology Education

In this section, the study presented that 68 (43.9%) of the students chose the faculties that they attended by their interest, 63 (40.6%) of the students chose by their family's influence, 43 (27.7%) of them chose by their career. The rest of the students decided by their friends' influence, teachers' influence, and societal influence. This implies that the majority of the students agreed that they would attend the faculties of their choice. This suggests that females are uninterested in engineering and technology and that their families may persuade them to pursue other fields such as health science.

This is in line with Akinsowon and Osisanwo (2014). They noted that a rel-

actively stable individual motivational disposition towards specific objects of interest is characterised by increased attention and, in most cases, positive effects and emotions. The object of interest could be concrete or particular content, an event, or ideas. Individual disposition towards interest is characterised by the tendency of individuals to re-engage with an object of interest and thus represents a relatively stable person–object relationship. Thus, in the engineering and technology education context, interest represents a student’s enduring nature to engage in engineering school subjects, representing objects of interest, such as physics and computer-related courses.

It was found that 35.5% of the students agreed, 26.5% disagreed, and 24.5% strongly agreed that traditional perceptions of “a woman’s place” are not in the engineering and technology fields. This implies that the majority of the students agreed with the statement, indicating that most of the students were aware of the gender gap and that parents, teachers, and community members needed to step up, support and encourage females to enter science, technology, and engineering faculties in order to change these perceptions. The study also presented that 47.1% of respondents strongly agreed, and 32.9% agreed that boys study more than girls in engineering and technology faculties at Somali International University (SIU) and throughout the country. This implies that the majority of the students strongly agreed with the statement, indicating that the majority of the students were aware of the female gap in engineering and technology education due to various bottlenecks among them, such as societal perceptions.

It was discovered that 76 (49%) of the students strongly agreed that boys have a greater chance of employability than girls due to the engineering and technology jobs in the market. 60 (38.7%) of the students also strongly agreed that society’s influence challenges girls attending engineering and technology faculties. A majority of the students felt that society and the market’s employability are the main factors causing the female gap in attending those faculties. This is in line with Bamberger (2014), who presented that students’ declarations on future career choices depend on gender identity. There is evidence that more boys than girls are willing to consider studying science and engineering in the future. Even girls, who believe they are capable of dealing with STEM, hold a view of the elimination of possibilities in these areas. Students make their decisions in order to conform to the traditional

notions of man and woman, whereby science and technology are considered for boys as a masculine identity and girls as a not-feminine identity.

The study also released that 58 (37.4%) of the students presented an employment factor as the one that contributes to the female's preference for other faculties than engineering and technology faculties. 52 (33.5%) of the students presented that society's influence is a factor that contributes to the female's preference for other faculties than engineering and technology. The rest of the students explained that capability and stereotype threats are other factors that may cause the female preference for other faculties other than engineering and technology. It's also in line with Bamberger's empirical review in 2014.

5.1.3 Influences of Workplace Among Female Gap in Engineering and Technology Education

The study presented that 48.4% of the students agreed, and 29% strongly agreed that there is an inequality in engineering and technology employment towards boys and girls when they graduate from the same faculties. This implies that most of the students agreed with the statement, which indicates that most girls prefer other faculties than engineering and technology because of inequality.

The study presented that 31.6% of the students agreed, 23.2% strongly agreed, and 24.5% disagreed that engineering and technology are more challenging for females than males. This shows that most of the students agreed with the statement, implying that the majority of the students had traditional notions of women or that there may be some circumstances, such as society, that drive them to believe that there is a form of challenge for female. This is in line with (Bamberger 2014), who noted that since both girls and boys perceive science and engineering as male domains, girls tend to believe they would not be capable of dealing with such subjects. Girls might think that women, in general, can pursue STEM careers, but not themselves. The belief in the capability of coping with STEM and having the necessary skills for STEM is the fundamental need for developing preferences for that profession.

The study findings presented that 33.5% of the students strongly agreed, 43.2% agreed, and 16.8% disagreed that girls' employment significantly impacts Somali culture. It also presented that 35.5% of the respondents agreed,

28.4% strongly agreed, and 21.9% disagreed that the working environment in engineering and technology is more suitable for males than females. This indicates that the majority of the respondents agree with the statement, which implies that most of the students had those traditional perceptions about the girls' capabilities.

The study also presented that 40.6% of the respondents agreed, 37.4% strongly agreed, and the rest disagreed that high priority opportunities are given to males in engineering and technology work placements.

The study found that 44.5% of the respondents agreed, 26.4% strongly agreed, and the rest disagreed that engineering and technology women are given the resources and training to do the work. It also presented that 41.9% of the respondents agreed, 29.7% strongly agreed, and the rest of the students disagreed that the organisation sends professional females for training, skill advancement, and empowerment every year.

5.2 Conclusions

The study concludes that the female gender gap in engineering and technology education is often caused by individual interests, passions, and family influences. The study also emphasised that traditional perceptions of “a woman's place” are not in the engineering and technology fields.

The study concludes that the female gap in engineering and technology education is caused by the fact that boys have a greater chance of employability than girls because of the engineering and technology jobs in the market and society's influence that challenges girls to attend the engineering and technology faculties. It was concluded that females prefer other faculties more than engineering and technology due to capability and social factors.

It was concluded that there is inequality in engineering and technology employment towards boys and girls when they graduate from the same faculties. The working environment in these fields is more suitable for males than females. It also concluded that engineering and technology are more challenging for females than males. It is also shown that girls' employment significantly impacts Somali culture.

5.3 Recommendations

To reduce the gender gap in engineering and technology education, attention should be given to addressing the contributory cognitive, motivational,

and sociocultural factors, primarily by maximising the number of career options that women perceive as attainable and compatible with their abilities and preferences and goals. Until then, a large number of technologically talented females will continue to fall through the cracks because their options are limited by cultural barriers, gender stereotypes, or misinformation. The goal, therefore, is to maximise career options for women by capitalising on female cognitive strengths by emphasising hard work and effort instead of talent, cultivating female interest in engineering and technology, and removing masculine stereotypes, misinformation, and obstacles that cloud career decisions. In order to achieve these goals, researchers, practitioners, and policymakers will need to increase their collaboration and communication efforts.

Researchers also need to convey their work to policymakers and practitioners who can put their findings into action by creating initiatives to influence the more significant cultural sphere at the macro-level or by working directly with females at the micro-level to increase their interest in engineering and technology.

5.4 Areas of further research

More research needs to be done on the following:

- Address gender differences within engineering and technology choice.
- Expand focus to female racial minorities.
- Translate research into evidence-based interventions.

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