

**SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA**



**KNOWLEDGE, PERCEPTION, AND EXPERIENCE OF PARTICIPANTS IN THE
INVISIBLE FISHER'S INTERVENTION IN THE VOLTA AND CENTRAL
REGIONS OF GHANA**

BY

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MASTER OF PUBLIC HEALTH (MPH) DEGREE**

JULY, 2019

DECLARATION

I, Boakye Ansah Jochebed Ode, declare that except for the other people's investigations which have been duly acknowledged, this work is the result of my own original research, and that this dissertation, either in whole or in part has not been presented elsewhere for another degree.

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DEDICATION

I dedicate this work to God Almighty for his divine guidance in my life. I also dedicate this work to the Boakye Ansah Family and all my friends.

ACKNOWLEDGEMENT

I would like to acknowledge the Almighty God for the strength and health he provided me throughout the course of my pursuance of this degree.

Am grateful to my supervisor, Professor Richmond Nii Okai Aryeetey, Department of Population, Family and Reproductive health for his help and guidance in making this final work a success. Much thanks to faculty members, who in one way or another helped to make his journey a success.

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My appreciation to my family and friends who has been with me and encouraged me, God bless you.

ABSTRACT

BACKGROUND: Anaemia continues to remain one of the world's public health concerns which affects people of all life stages. It has a global prevalence of 32.9% and particularly affects the Sub-Sahara regions. In Ghana, there is an anaemia prevalence of 42% in women in the reproductive age group. Several interventions have been put in place to curb this public health concern in the country but the prevalence remains at an alarmingly high rate. A pilot study (Invisible fisher's intervention) was conducted recently in the Volta and Central regions of Ghana among women in the fishing Chain using mobile technology to communicate behavior change messages. This study was conducted to see how feasible this new way of intervening can reduce the prevalence of anaemia in the country.

AIM: To assess participants' knowledge, perception, and experience of the invisible fisher's communication intervention.

METHOD: A descriptive study design using a qualitative research approach, precisely a phenomenological study to obtain data. Both focus group discussions and an in-depth interview were conducted with selected women who participated in the invisible fishers' pilot project, district fisheries representative, project field officers, and volunteers using a semi-structured interview guide. The data collected were transcribed, coded and analyzed to generate themes with the help of qualitative data analysis software 'Nvivo version 11.0'

RESULTS: Reviews about the success of the IF Project by stakeholders interviewed were generally positive, even though some admitted a couple of challenges encounters. They held that this project was largely helpful and brought about positive outcomes. Beneficiaries were generally agreed that the IF Project had impacted their lives positively.

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LIST OF ABBREVIATIONS

ACD-	Anemic of Chronic Disease
AIDS –	Acquired Immunodeficiency Syndrome
ASFs -	Animal Source Foods
BCC –	Behavior Change Communication
DANIDA-	Danish International Development Agency
FGD –	Focus Group Discussion
GDHS –	Ghana Demographic and Health Survey
GHS-	Ghana Health Service
GIFTS –	Girls iron folate tablet supplementation
GoG-	Government of Ghana
GSS-	Ghana Statistical Service
Hb-	Hemoglobin
HIV –	Human Immunodeficiency Virus
IDI –	In-depth Interview
IF-	Invisible Fisher's
ILO-	International Labor Organization
MFA-	Ministry of Fisheries and Aquaculture

NCD-	Non- Communicable Disease
NIH –	National Institute of Health
NTDs –	Neural Tube Defects
PLWHA –	People living with HIV/AIDS
SCD-	Sickle Cell Disease
SPRING –	Strengthening Partnerships, Results, and Innovations in Nutrition Globally.
TA-	Treatment Arm
UNDP-	United Nations Development Program
UNFPA-	United Nations Population Fund
UNICEF-	United nations International Children’s Emergency Fund
USAID-	United States Agency for International Development
WHO-	World Health Organization
WRA-	Women of Reproductive Age

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

One global problem affecting all stages of life is anaemia (McLean, Cogswell, Egli, Wojdyla, & de Benoist, 2009). It has a world prevalence of 32.9%. (Kassebaum, Jasrasaria, Naghawvi, Wulf, Johns, et al., 2014). Anaemia particularly affects developing countries in sub-Saharan Africa (McLean, Cogswell, Egli, Wojdyla, & de Benoist, 2009). Almost half of all anaemia is caused by iron deficiency (Stevens, Finucane, De-Regil, Paciorek, Flaxman, Branca *et al.*, 2013). Ghana has a high prevalence of anaemia (42%) among women in the reproductive age (15-49) (GSS, GHS, USAID, UNDP, UNFPA, DANIDA, ILO, UNICEF, 2015)

Interventions to address anaemia in Ghana include iron-folic acid supplements for pregnant women, insecticide-treated bed nets for pregnant women, and anti-helminthic drugs for pregnant and school-going children (Spring & GHS, 2016) and recently girls iron folate tablets supplementation (GIFTS). The Invisible fishers (IF) project (July 2018 to March 2019) tested a set of interventions intended at mitigating anaemia among women. The interventions included a behavior change communication strategy (BCC) focused on promoting the consumption of micronutrient-rich animal source foods (ASFs), reducing malaria and soil-transmitted helminthes control practices, and adopting optimal water, sanitation, and hygiene practices (TA1). Other strategies in the project were strengthening women fish processors' engagement with markets through a group-based microcredit scheme (TA2), and adoption of improved fish smoking technology to reduce harmful exposures during fish smoking (TA3).

All the women participating in this pilot study irrespective of the treatment arm (TA) were provided with mobile phones as the medium for receiving BCC messages (via automated voice calls). All women also participated in village-based bi-monthly group meetings which reinforced messages received via the phone, during the previous fortnight. Women in TA2 also received unannounced home visits, at least once a week.

In 2003, prior to the implementation of a wheat flour fortification (WFF), a communications campaign relating to anaemia was conducted in the Kyzyl-Orda region of Kazakhstan, an area considered to have a high prevalence of iron deficiency anaemia (IDA). Following the implementation of a wheat flour fortification (WFF) with iron project in Kazakhstan, a study was conducted by Baizhumanova, et al. (2010) to assess the effectiveness of communication a campaign on anaemia.

The subjects for this study that was intended to assess the effectiveness of this communications campaign encompassed women aged 15-49 years and children aged 2-14 years. Aside from the laboratory testing of blood samples of respondents, questionnaires were administered to 195 women in March and 198 women in December. The study found a significant decline in the prevalence of anaemia among both urban and rural women and urban children. The study also showed increased knowledge about anaemia and its prevention among participants. Overall, the study showed that the communication campaign embarked upon prior to the implementation of WFF program was a resounding success; the communication campaign was well implemented, giving a biological impact on hematological indices (Baizhumanova, et al., 2010).

This current study will go a long way in understanding how feasible BCC can be used to mitigate anaemia in our Ghanaian setting.

1.2 Problem statement

Participants for the Invisible Fisher's pilot study were recruited into a nine-month feasibility study. Data were collected at baseline, at the midpoint, and end line. Monitoring data of the project showed that some women did not pick-up calls. Also, participation in the bi-weekly meetings was below expectations.

To understand why women responded to the behavior change communication, it is important to determine desirability and ease of uptake of the intervention by the participants. Questions that need to be answered include whether women who did not pick the calls any longer wanted to continue participating. Also, it is important to identify the barriers to picking up calls and participating in bi-weekly meetings. It is also important to determine if participants want the messages to be delivered to them in another way, and to explore acceptability to use the phones.

The study seeks to understand the participants' perceptions of either positive or negative changes that have occurred from participating in the interventions their perception about the importance of anaemia. Whether they believe the intervention is not helping them, taking too much of their time hence not listening to the messages or attending the weekly meetings. If they believe the project is helping them then why the varied pick-up and call back rates?

1.3 Significance of the study

It is important to understand the feasibility of using mobile phones to communicate behavior change messages. To prevent the wastage of money and resources, there is the need to test how feasible the BCC is in our setting. This current study is therefore important as it aims to understand the changes in the behavior of the participants and to understand that which is

causing the changes in behavior. It also seeks to understand possible barriers and suggestions of the participants as to how best the intervention can be made to suit them. Findings from this study will help to determine the feasibility of the communication intervention arm the Invisible Fishers project.

1.4 Research questions

1. What are participants' perception of the project?
2. What new knowledge were acquired by participating in the intervention?
3. How desirable and easy is the up-take of the strategy?
4. What changes were encountered by joining the intervention?
5. What challenges and barriers have been encountered?

1.5 Aim of the study

To assess participants' knowledge, perception, and experience of the invisible fisher's communication intervention.

1.5.1 Specific objectives of the study

1. To determine the participants' perception of the intervention when they were recruited.
2. To determine women's perception of the importance of the intervention.

3. To determine new knowledge participants' have received from the intervention.
4. To ascertain their experiences during the course of the project
5. To describe changes that respondents have made in response to the project.
6. To identify barriers and facilitating factors to the uptake of the intervention.

1.6 Conceptual Framework

Facilitating Factors

Barriers to intervention

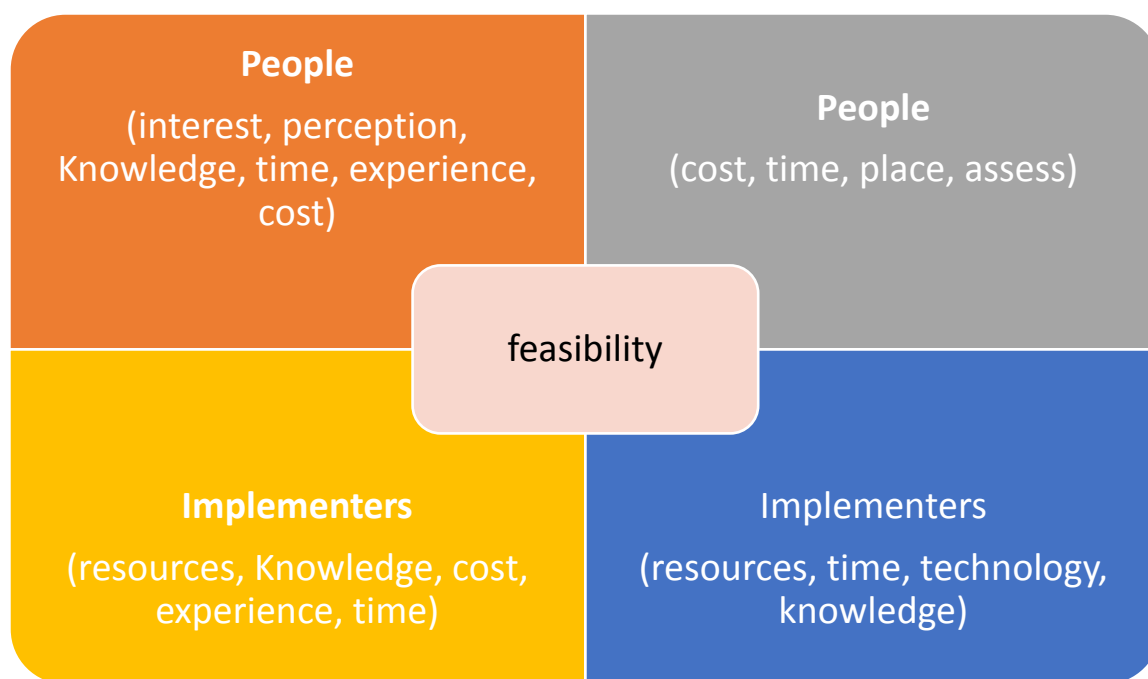


Figure 1 Feasibility Framework

For any intervention to work, its workability needs to be tested. The feasibility of and intervention will have both facilitating and inhibitory factors. The people partaking in the

intervention can facilitate it if they have an interest in it. Also, their perception, cost, and time are some factors that can facilitate the progress of the intervention. Implementors resources, knowledge, cost involved, experience and time allocation can also aid in the feasibility of a study.

Barriers or challenges can also impede the progress of an intervention. These barriers can be from the participants themselves i.e. cost involved, time taking, and the area the intervention will take place. Implementors can also impede the feasibility of an intervention by not having adequate resources, technical and technological know-how, and adequate knowledge on their part and how to communicate these knowledges to participants.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter discusses relevant literature on anaemia in women of the reproductive age globally but with emphasis on the sub- Sahara Africa and Ghana. It focuses on the different causative agents of anaemia such as iron deficiency, chronic diseases such as malaria and helminthes infestation.

2.2 Anaemia

Anaemia is a condition that outcomes when the quantity of red platelets or their oxygen-conveying limit is deficient to address physiologic issues, which shifts by age, sex, height, smoking, and pregnancy status (Getachew, Yewhalaw, Tafess, Getachew, & Zeynudin, 2012). The fundamental and significant capacity of iron (as a piece of hemoglobin) is to ship oxygen from lungs to cells in our body and is a basic prerequisite of the body. Iron is significant for the generation of hemoglobin by erythroblasts. If iron supply isn't sufficient, the HB creation does not succeed and the quantity of red platelets diminishes (Milman, 2011). This condition is otherwise called “Anaemia”

2.3 Epidemiology of Anaemia

One remarkable general medical issue in developing countries which happens intermittently among ladies of the reproductive age and youngsters is anaemia (WHO, 2018). Anaemia is

distressing both developing and developed nations and is a world general medical issue with significant ramifications for human wellbeing just as financial advancement. It happens at all phases of the existence cycle yet is increasingly common in pregnant ladies and youthful kids (WHO, 2008). In India, it is a typical medical issue among ladies between the ages of 15-49 years of age (Kaur & Kochar, 2009). The epidemiology of anaemia contrasts among locales all around because of contrasts in financial and other impacting elements, for example, nation explicit strategies.

Universally, 1.62 billion individuals are influenced by anaemia which compares to 24.8% of the total populace (WHO, 2018). Most of the prevalence is found in youngsters (47.4%) and the least is that of men (12.7%). The highest number of people affected is the populace gathering of non-pregnant ladies (468.4 million) (WHO, 2018). The most astounding extent of people influenced is in Africa (47.5–67.6%) while the greatest number affected is in South-East Asia (315 million). These are appraisals produced by the World Health Organization for preschool-age youngsters, pregnant and non-pregnant ladies (WHO, 2018).

2.4 Risk Factors of Anaemia

In developing nations, particularly the sub-Sahara Africa, the hazard variables prompting anaemia is multifactorial and incorporates dietary inadequacies of iron, folate, and nutrient B12, vitamin C, parasitic ailments, for example, malaria and hookworm (Addis & Mohamed, 2014). Inflammation may likewise be a typical reason for iron deficiency, yet regularly hard to completely isolate from different factors particularly in territories with a high presentation to intense and ceaseless contamination (Milman, 2011).

2.4.1 Nutritional Anaemia

Nutritional anaemia can come because of iron inadequacy (Addis & Mohamed, 2014). Iron is one of the minerals required by our body to complete a portion of the fundamental capacities. The most critical supporter of the beginning of anaemia all-inclusive is iron insufficiency to the degree that iron inadequacy anaemia and anaemia are regularly utilized synonymously and the predominance of anaemia has frequently been utilized as intermediary for iron deficiency anaemia (WHO, 2018).

Iron insufficiency is commonly expected to cause around 50% of all anaemia cases and is well-characterized into three periods of combined seriousness: iron stores consumption (stage 1), iron inadequacy barring sickness (stage 2), and iron lack with anaemia (stage 3) (Scholl, 2011). As in anaemia, the hazard of iron deficiency anaemia is expanded in ladies in the regenerative age just as pregnant ladies. Inadequate utilization of iron-rich sustenance, poor ingestion of iron from weight control plans high in phytate or phenolic mixes, is connected to press insufficiency even with circumstances that builds the requirement for iron admission like what is discovered in pregnancy and development, where there is a quick increment in red platelet mass and development of the pregnancy (Scholl, 2011).

Going about as a coenzyme, and in various natural responses as an all-inclusive methyl group giver is the water dissolvable nutrient Folic Acid (Shane, 2011). A portion of its capacity incorporates the union of nucleic acids, erythroblasts, and sensory tissues (Shane, 2011).

Megaloblastic anaemia which guarantee from insufficient erythropoiesis is one of the numerous results of lack folate (Koury & Ponka, 2004) thus additionally is neural tube defects (NTDs). NTDs are intrinsic mutations caused when there is an open of the neural tube which does not close during the principal month of pregnancy (Shane, 2011).

Hyperhomocysteinemia, a hazard factor for metabolic and cardiovascular ailments is likewise an elective worry of folic acid insufficiency (Ndiay, Idohou-Dossou, Diouf, Guiro, & Wade, 2018). Folic acid insufficiency is of a general wellbeing concern internationally under sustenance, like anaemia due to nourishment (Ndiay, Idohou-Dossou, Diouf, Guiro, & Wade, 2018). Lack of Folic acid is ordinarily owed to inadequate intake through eating regimen however can likewise come from avoidances in folate digestion, intestinal malabsorption, and perpetual liquor abuse or increased needs during pregnancy (Ndiay, Idohou-Dossou, Diouf, Guiro, & Wade, 2018). A decent marker of dietary folate intake is plasma folate concentration and is the most generally utilized procedure when evaluating folate status. For long haul status, in any case, erythrocyte folate is the best, which is genuine additionally for tissue stores (Allen, de Benoist, Dary, & Hurrell, 2019). In spite of the fact that it is a worldwide general wellbeing concern, the world prevalence of folate deficiency isn't known. At the national or provincial levels, few studies were intended to evaluate the populace's folate status and the commonness indicated extraordinary changeability. Commonness' of folate insufficiency was 79.2%, 31.1%, 36.3%, 19%, and 27.6% among ladies in Sierra Leone, Ethiopia, Venezuela, Bangladesh, and South Africa, individually (Ndiay, Idohou-Dossou, Diouf, Guiro, & Wade, 2018).

B12 insufficiency, otherwise called lack Cobalamin, is the ailment of low blood levels of nutrient B12 (Herrmann, 2011). In gentle inadequacy, an individual may feel tired and have a decreased number of red platelets (anaemia) (Hunt, Harrington, & Robinson, 2014). In moderate insufficiency, there might be an aggravation of the tongue and the start of neurological issues including irregular sensations, for example, sticks and needles, while serious lack may incorporate diminished heart work and more prominent neurological issues

(Hunt, Harrington, & Robinson, 2014). Neurological issues may incorporate changes in reflexes, poor muscle work, memory issues, diminished taste, and in extraordinary cases psychosis (Hunt, Harrington, & Robinson, 2014). Now and then temporal infecundability may likewise happen. In youthful kids, side effects incorporate poor development, poor advancement, and challenges with development (NIH, 2016). Without early treatment, a portion of the progressions might be perpetual (Lachner, Steinle, & Regenold, 2012).

Regular causes incorporate poor assimilation from the stomach or digestive organ, diminished intake and expanded prerequisites (Hunt, Harrington, & Robinson, 2014).). Diminished ingestion might be because of pernicious anaemia, surgical evacuation of the stomach, perpetual inflammation of the pancreas, intestinal parasites, certain medications, and some hereditary issues. Decreased intake may happen in vegetarians or individuals who are malnourished (Hunt, Harrington, & Robinson, 2014). Expanded necessities happen in individuals with HIV/AIDS, and in those with quick red platelet breakdown (Hunt, Harrington, & Robinson, 2014). Diagnosis is commonly founded on blood levels of vitamin B12. Raised methylmalonic acid levels may likewise demonstrate a lack. A kind of anaemia, megaloblastic anaemia is frequently but not constantly present (NIH, 2016).

2.4.2 Chronic Disease and Anaemia

Anaemia may likewise result from unending ailments, for example, malaria, ceaseless kidney disease, and different ailments. The second most normal reason for anaemia is Anaemia of chronic diseases (ACD) (Weiss & Goodnough, 2005). Distinguished first in 1962 when concentrates on anaemia were related to infections (Cartwright & Wintrobe, 1962). ACD can result from various clinical conditions, for example, inflammatory disarranges (counting

incendiary bowel sickness and rheumatologic conditions), contaminations and harm; 75% of cases are because of these three. ACD is invulnerable driven.

Activated leucocytes incited cytokines that apply different impacts which add to the fall in hemoglobin and involves changes in erythropoietin action, iron homeostasis, the life expectancy of erythrocytes and erythropoietin creation (Peng & Uprichard, 2017). Anaemia of Chronic renal failure is a specific instance of ACD. A lessening in circulating erythropoietin prompts a decrease in erythropoietin action and this enemy of proliferative impact improves the gathering uremic toxins (Peng & Uprichard, 2017). In end-stage renal disease patients, the level of anaemia has additionally been appeared to relate with constant aggravation. Resistant cells enactment may originate from contact initiation from dialysis films or potentially rehashed disease. The progressions of iron homeostasis in these patients reflect those found in ACD (Weiss & Goodnough, 2005).

2.4.3 Infections/ Infestation and Anaemia

Malaria is the most significant man parasitic infection (White, Pukrittayakamee, Hien, Faiz, Mokuolu, & Dondorp., 2014). In endemic territories, it is a noteworthy reason for iron deficiency and is a standout amongst the most widely recognized explanations behind blood transfusion in regions of higher transmission malaria. The genus *Plasmodium* has six species infecting people and all-cause anaemia. Serious infection and most malaria inferable passing are brought about by *Plasmodium falciparum* with a larger part of fatalities happening in the community. An estimation of somewhere in the range of 216 million cases and 445,000 passing's from malaria in 2016 was made by the World Health Organization (WHO, 2017). Anaemia brought about a huge extent of these passing legitimately or in a roundabout way

from. The force of malaria transmission impacts the clinical results of malaria, and specifically the predominance of anaemia.

Determinants of malaria transmission force are predominantly the thickness, life span, effectiveness of the neighborhood mosquito vectors and gnawing propensities (White, et al., 2014). In settings of high transmission, as much as one irresistible chomp every day might be gotten by individuals, thus the whole populace is contaminated over and again, yet the youthful youngsters endure the worst part of the infection, with most being anaemia (Weatherall, 2008). Anaemia during pregnancy is normal in tropical districts with malaria the significant contributor (Desai, et al., 2007). As pregnancy advances, the dangers of anaemia increment particularly in high transmission settings where extreme hemolytic anaemia may happen in the subsequent trimester. Exacerbation of malarial anaemia in pregnancy may happen if there is an attending HIV disease. High maternal parasitaemias are related to fetal and new-born anaemia (Accrombessi, et al., 2015). Asymptomatic infection in the mother is hurtful for the fetus and lessens birth weight. Counteractive action is better for both mother and child yet suggestive diseases require quick treatment. Infectious and parasitic diseases, in particular, helminthes infestations and urinary tract infections are also important factors contributing to the high prevalence of anaemia in sub-Saharan Africa (Asobayire, Adou, Davidsson, Cook, & Hurrell, 2001). Helminthes pervasions, particularly hookworm and schistosomiasis, cause blood loss and along these lines to add to build the hazard for iron deficiency anaemia. Helminthes are known to be huge contributors to the general anaemia load in the developing world (Stephenson, Holland, & Cooper, 2000).

The wellbeing continuation related to anaemia is the most articulated in youngsters and ladies of conceptive age (Ezeamama, et al., 2005). The negative effect that high-power helminthes

diseases have on hemoglobin levels has been convincingly exhibited through observational and interventional investigations of numerous populaces (Ezeamama, et al., 2005). The numerous abuse due to helminthes in constantly exposed populaces is accepted to endure for the duration of existence. For instance, incessantly infected youngsters are probably going to develop into grown-ups with a decreased physical limit with regards to work, which eventually converts into a lessened commitment to the nation (Gilgen, Mascie-Taylor, & Rosetta, 2001).

2.4.4 Genetic Disorders and Anaemia

Some people are born with hereditary anomalies that can cause specific sorts of anaemia, including sickle cell anaemia, thalassemia, and Fanconi anaemia. The presence of transformed types of hemoglobin and hemoglobin S (HbS) prompts hereditary issues, for example, Sickle cell disease (SCD) and its varieties. The sign of these ailments is a sort of anaemia known as sickle cell anaemia. This is an autosomal latent disorder, coming about because of a point change and prompting the substitution of glutamic acid instead of valine, at the 6th area of the beta-globin chain (Agbaje, Adeyomoye, Omidiji, Oboke, & Afolabi, 2018). The haemoglobin molecule that results from this change has abnormal physiochemical properties leading to the chronic disease state manifestation. Globally, up to 20 to 25 million people are affected by SCD (Mulumba & Wilson, 2015). In the USA, the precise prevalence of SCD is unidentified, but a study by Brousseau, Panepinto, Nimmer, & Hoffman, (2010) to estimate the entirety of individuals with SCD in the nation as at 2005 indicated 89,079 individuals. In India, the predominance shifted relying upon the clan, from 1% to 40%, with Madhya Pradesh having the uppermost burden, which is an estimated number of 67,861 homozygotes and of 961,492

heterozygotes (Colah, Mukherjee, Martin, & Ghosh, 2015). Approximately 2% of all newborns around Kumasi, and its environs have SCD. This equates to around 16,000 annual births with SCD in Ghana (Owusu, 2010). The circulation of distorted red blood cells through low oxygen tension areas forms the pathophysiology of sickle cell anaemia. The cells with time become irreversibly sickled which leads to its removal from circulation by the reticuloendothelial framework or the impediment of little fine beds, prompting an infarction emergency (Agbaje, Adeyomoye, Omidiji, Oboke, & Afolabi, 2018).

In case of an ordinary pregnancy, various physiological changes occur, among them vacillations in the hemodynamic status of the patient. There is an upsurge by 10% to 15% of Plasma volume at 6 to 12 weeks of incubation, growing rapidly up until 30 to 34 weeks pursued distinctly with an unobtrusive ascent (Ekong & Anietie, 2017). On midpoints, the whole increase at term is 1100 to 1600 ml, with a resultant plasma volume of 4700 to 5200 ml contrasted with non-pregnant ladies, with 30% to half over that discovered (Agbaje, Adeyomoye, Omidiji, Oboke, & Afolabi, 2018). There is an exacerbation of the condition in ladies previously at the baseline and a subsequent physiological anaemia during pregnancy.

2.5 Anaemia in Reproductive Age Women

One of the six worldwide nutrition targets set out by the World Health Assembly is to lessen anaemia in women of reproductive age (WRA) by half in 2025 (WHO, 2014). The worldwide prevalence of anaemia in non-pregnant ladies of the conceptive age is 30.2% (WHO, 2008).

As of 2011, 496 million non-pregnant women were anemic (WHO, 2015), making it an ascent of 50 million non-pregnant females since 1995 (Stevens, et al., 2013). Roughly, 33% of all instances of anaemia over the world are menstrual age ladies. This anaemia is chiefly because

of iron lack. Negative iron parity is for the most part brought about by lacking dietary iron intake (because of consumption of an eating regimen with a little bioavailable iron content), expanded loss of iron because of unending blood loss in ladies, inferable from monthly cycle and (Kaur & Kochar, 2009) heightened in instances of heavier menstrual bleeding (Low, Speedy, Styles, De-Regil, & Pasricha, 2016). Physical work limit and regenerative physiology are influenced when ladies of menstruating age become anemic (Kaur & Kochar, 2009).

Anaemia in pregnant ladies has genuine wellbeing implications and the seriousness of it during pregnancy can essentially add to maternal mortality and morbidity (Addis & Mohamed, 2014). Proof demonstrates that extreme anaemia's can increase perinatal morbidity and mortality by causing intrauterine development impediment and preterm delivery (Getachew, Yewhalaw, Tafess, Getachew, & Zeynudin, 2012). As indicated by a meta-analysis and systematic review, the dangers of poor birth results, for example, low birth weight, preterm birth, perinatal and neonatal mortality increases when one has anaemia during pregnancy (Rahman, et al., 2016). Iron deficiency anaemia in newborn children may weaken psychological advancement (McLean, Cogswell, Egli, Wojdyla, & de Benoist, 2009).

Affiliation has been made between maternal mortality and hemoglobin concentration during pregnancy (Stoltzfus, Mullany, & Black, 2004) for each 10-g/L increment in hemoglobin there is a diminished danger of maternal mortality by 25%. In addition, there is a decrease in work efficiency in non-pregnant WRA with anaemia, likely because of a decrease in the oxygen-conveying limit of a person's blood.

In Ghana, the general prevalence of anaemia is 66 percent among youngsters age 6–59 months (GSS, GHS, & ICF, 2015) and 42 percent among ladies of reproductive age (GSS, GHS, & ICF, 2015). There was a moderate decrease in the commonness of anaemia in kids

and ladies somewhere in the range of 2008 and 2014: 12 percent for kids and 16 percent for ladies. Among youngsters, the decrease would in general lopsidedly advantage less helpless gatherings, particularly kids from the most elevated quintiles of riches and kids whose moms' had essential, center, or auxiliary instructions. Among ladies, the decrease was seen consistently crosswise over urban and provincial territories and topography and riches subgroups. Anaemia fundamentally declined among pregnant just as breastfeeding and non-pregnant ladies.

2.6 Communicating Behaviour Change and Social Learning

Good communication strategies use ideas that range from psycho-social learning speculations of job displaying imparted through the broad communications to the utilization of promotion and social assembly. Discourse with and dynamic support of people are fundamental components in correspondence for conduct and social change. Numerous correspondence projects have for since quite a while ago centered much around the allegorical "tree" and insufficient on the "timberland", for example the consideration was on the person as the locus for change.⁵ For practices to change on a huge scale, be that as it may, unsafe social qualities, cultural standards and basic disparities must be mulled over. Good communication strategies additionally must be perceptive of the approach and authoritative condition and be connected to support conveyance angles, be it, for instance, vaccination corners or private directing administrations for individuals living with HIV (UNICEF, 2005). Vital utilization of behaviour change communication (BCC) applies target message and custom fitted ways to encourage healthy behaviours and diminished risk taking. BCC also acknowledged as social and behaviour change communication additionally includes health communication, social and

communal assembly and it evolved from information, education and correspondence (IEC) methods. With constituents going from relational correspondence between a communal health worker and her client to staggered broad communications media campaigns, proof based and concept driven BCC interventions are a necessary piece of a wide range of health advancement and disease deterrence, and have been appeared to essentially improve practices, prominently in zones of family planning and HIV prevention (Koenker, et al., 2014).

2.7 Mobile Technology, Disease Control, and Social Learning.

This segment of the review of relevant literature focuses on a review of some empirical studies conducted to evaluate other health communication interventions/projects around the globe. The interchange between broadcast communications travel, and vis-à-vis gatherings is an uncertain riddle. Now and again it has been proposed that media communications might be a substitute for physical connection (Albertson, 1977) - a thought that picked up footing during the nineties and the quick extension of the Internet (Cairncross, 1997).

In different cases clashing theories have been made, including those that are reciprocal (Mok, Wellman, & Carrasco, 2010), impartial (Choo, Lee, & Mokhtarian, 2010) or fortifying (Sasaki & Nishii, 2010).

Versatile and electronic innovation has come to remain as the world advances. With the possibility to give individualized help, conduct change technique, and inspirational messages more often than not, performed vis-à-vis can be adjusted to suit ethnic gatherings, sex and age gatherings and conveyed by means of a cell phone (Free, Whittaker, Knight, Abramsky, Rodgers & Roberts., 2009). With the messages being no concurrent, (messages are gotten to by people when it's helpful for them), support can be conveyed to an objective gathering any

place and at whatever point it is required without them strolling to wellbeing focuses or bolster habitats for it (Free, et al., 2011). This method of intercession likewise considers quantifiable communications and helps in checking and correlation of encounters (Fjeldsoe, Marshall, & Miller, 2009).

Completely automated conduct change messages can be conveyed to a moderately enormous number of individuals, this is partly due to the across the board of cell phones proprietorship and furthermore on the grounds that it accompanies a lower cost. More than two out of each third individual possessed a cell phone as at 2009 (ITU, 2009) As of late, interpersonal organizations have been distinguished as potential indicators of movement conduct, just as the conceivable choice to work from home. Social connection has consequently been incorporated in action travel models, notwithstanding the current classifications of movement, for example, driving, recreation, and business. Moreover, specialists such (Calabrese, Smoreda, Blondel, & Ratti, 2011) have contended that streams and gatherings of individuals produce little universes, which require associations and meeting places - a wonder which is otherwise called the new mobilities worldview. Tele-health care management is a broadly acknowledged procedure for improving the results of individuals with non-transmittable ailments (NCDs). Indeed, even in low-asset nations, most grown-ups approach a phone, (Piette, Mendoza-Avelares, Milton, & et al, 2010).

Contemplates in Latin America demonstrate that nurse tele-management can improve NCD results. Mobile health (m-health) services seek to increase access to between-visit support by augmenting clinician contact with automated services delivered via smartphones (Boulos, Wheeler, Tavares, & Jones, 2011) short message administration (content informing), (Wei, Hollin, & Kachnowski, 2011) and automated calls (Estabrooks, Shoup, Gattshall, Dandamudi,

Shetterly, Xu, 2009). With the expanded utilization of cell phones to convey wellbeing and conduct change messages, late audit is presently guiding their thoughtfulness regarding the viability of this technique (Fjeldsoe, Marshall, & Miller, 2009). Mechanized phone the board and conduct change calls have been believed to improve self-care and wellbeing results among NCD patients and might be more financially savvy than face to face visits or calls with "live" clinicians (Estabrooks, et al., 2009).

In a study conducted by Green, Kreuter, Deeds, & Partridge, (1980) to measure hand hygiene compliance among health care workers before and after the implementation of a health campaign that was theory-based, disclosed through a structured observation a significant improvement in hand hygiene compliance among healthcare workers from 51% to 83%.

The researchers also administered a self-reported knowledge, attitudes, and beliefs questionnaire which showed a substantial increase in the knowledge of guidelines among healthcare workers in Ireland (Creedon, 2005).

A French study that assessed the effectiveness of a comic-strip Hepatitis C communication campaign, focused on adolescents and employed a pre-test and pro-test design using questionnaires. The study found considerable improvement in knowledge scores of participants following the information session. This was particularly so with participants who admitted to having read the comic strip relative to participants who had not done the same (Ingrand, Verneau, Silvain, Beauchant, 2004).

A Dutch study was conducted to evaluate the success or otherwise of three (3) safer sex interventions that were essentially based on the Theory of Planned Behavior and which were rolled out over the course of three consecutive years. Researchers found that despite high

outcome measures at baseline, these health interventions positively impact all relevant variables (Ajzen & Fishbein, 1980; Yzer, Siero & Buunk, 2000).

Lambert, Masters, and Brent (2007) conducted a regional evaluation study that was intended to assess the efficiency of mass media projects/campaigns for putting in check the prescription of antimicrobial in the United Kingdom. They employed a retrospective study design, making the most of the data obtained from the Prescription Pricing Authority coupled with surveys of primary care organizations. Their studies showed that there had been a 5.8% decline in prescription drugs that may be partly attributable to the mass media campaigns.

Peretti-Wate, Obadia, Dray-Spira, Lert & Moatti (2005) conducted a study in France to assess the effects of nation-wide mass media campaigns on the attitudes and conduct of HIV/AIDS patients and with a specific focus on conducts that are considered to pose HIV-related risks.

This study employed surveys, conducted face-to-face coupled with the use of clinical data that were ethically accessed from the doctors of these patients. The study though lacking a comparison group to concretize its findings nonetheless indicated the potential inherent in mass media health-related campaigns, and more particularly as a means of curbing people living with HIV/AIDS (PLWHAs).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This chapter describes the research methods to be used to generate empirical data for this study. Specifically, it gives information on the research design, target population, study population, sampling technique, sample size, sources of data, methods of data collection, data handling and analysis, and ethical considerations. This section conforms to the consolidated criteria for reporting qualitative research (COREQ) (Tong, Sainsbury, & Craig, 2007).

3.2 Study design

The purpose of the IF research was to inform the design, implementation, and evaluation of a full Randomized Control Trial (RCT). As such, the design of the IF pilot research mimicked that of an RCT with three distinct treatments delivered to women in separate study arms. Though a control group would be included in the RCT, for the purposes of the IF pilot research, no control arm was included. Two communities in each study region were assigned to one of the three treatment arms (i.e., six communities in total per region). Scheduled customized audio calls contained key behavior change information circulated to participants in a language of choice with no cost to them. The time for the automated calls to be sent were determined by the women, hence each chose the time convenient for them to receive the calls.

This current study, which is a subset under the main IF project was an observational cross-sectional study, using a qualitative research approach, and a phenomenological perspective for

data collection and analysis. A qualitative study was deemed appropriate as it gives the researcher the opportunity to gain a deeper appreciation into participants' understanding, knowledge, experience and perception of the invisible fishers' project.

3.3 Study Area

The IF project took place in two different districts each of the Volta and Central Regions of Ghana. In each district, six communities were sampled to be involved in the intervention.

These two regions serve as a representation of small-scale fisheries systems (i.e., marine and freshwater, respectively). This current study was carried out in these same two districts each of Volta and Central regions of Ghana. In Volta Region, the two districts involved were the Kpando and South Dayi district

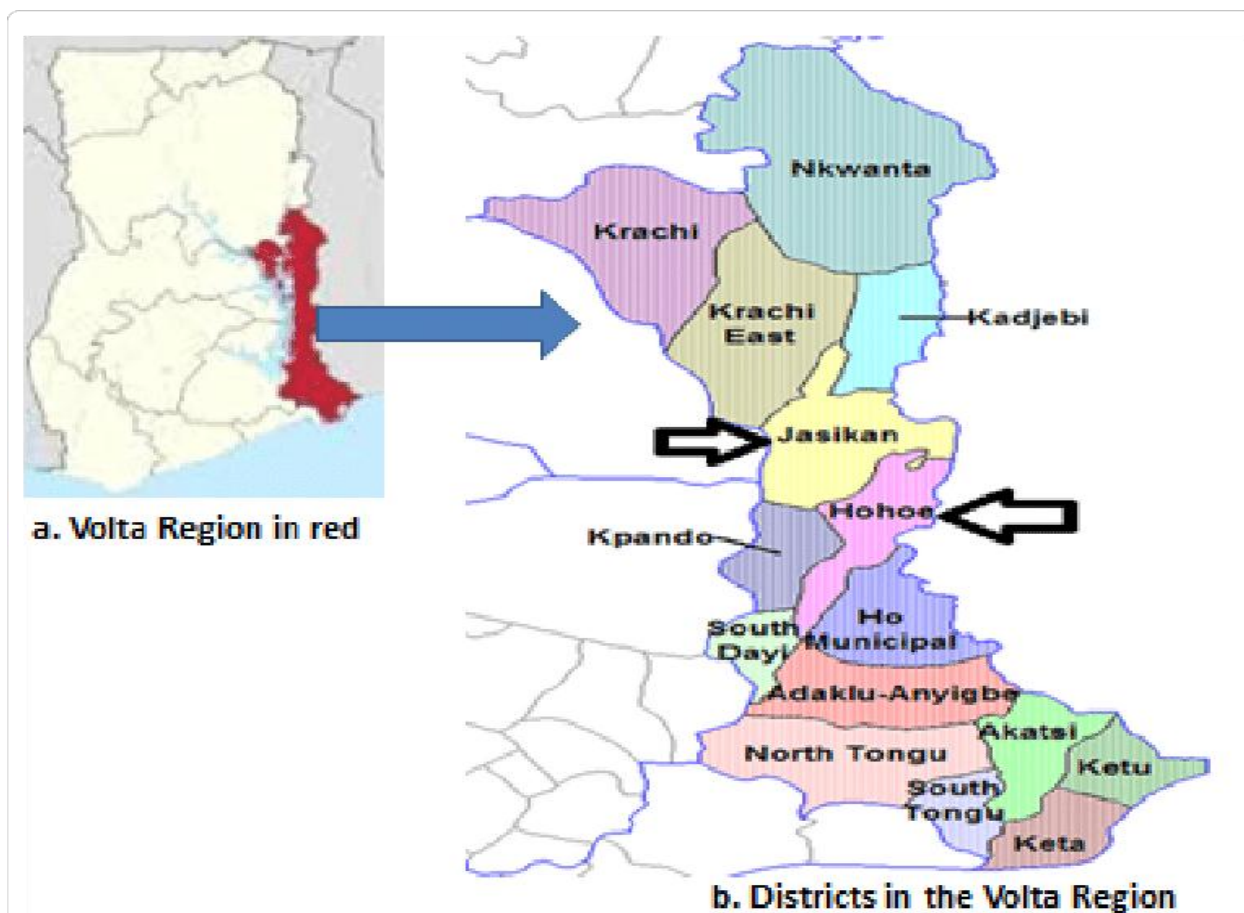


Figure 2 Map of the Volta Region with Districts.

.Source: Wikipedia, 2019

Kpando municipality: it is bounded by Jasikan district to the north, South Dayi to the south, Hohoe municipal district to the east and by Lake Volta to the west. According to the 2010 Population and Housing Census, the population of this district is about 53,735 making up 2.5% of the region's total population. About 51.8% of the population is female and it has an 89.8% dependency ratio. The municipality has a total fertility rate of 3.0 and a 1.4 person's average household size. More than half of the females between ages 25-29 years (55.7%) are married with four in every tenth person in the population over the age of twelve years or older

being married. People aged eleven years and above, eight-five (85.5%) percent of the populace are literate. Also, 32% of the population in the municipality is involved in skilled agriculture, forestry, and fishery work. (GSS, DANIDA, & DFATD, 2014)

South Dayi District: this district is located between longitude $0^{\circ}17'E$ and latitude $3^{\circ}20'N$ and $3.5^{\circ}05'N$. Lake Volta lies to west and south of the district, to the east is Ho Municipal District and Adaklu-Anyigbe district. Kpando district and Afadjato lies to the north of South Dayi District. From the 2010 GSS Population and Housing census, the district represents 2.2%, of the region, which is 46,661 people. Approximately fifty-two (52.6%) of the population is female with a dependency ratio of about 86.5%. The total fertility rate of the district is 3.3 with a 4.2 household average size.

Almost half of the populace from the age of twelve and above is married. By age 25-29 years, almost three-fourth (71.6%) of all females would be married. From eleven years old eight out of every ten people are literate (83%) with almost half of the population (43.5%) involved in forestry, skilled agriculture and fisheries (GSS, DANIDA, & DFATD, 2014)



Figure 3 Map of Central Region with Districts

Source: Wikipedia, 2019

In the Central region, the study was conducted in the Ekumfi and Mfantseman district.

Mfantseman District is located along the Atlantic coastline of the Central Region; it lies on longitudes 0°44' to 1°11' west of the Greenwich Meridian and latitudes 5° to 5°20' north of the equator. It is bounded by Abura-Asebu-Kwamankese District to the west and northwest, the Atlantic Ocean to the south and Ekumfi District to the east. According to the 2010 Population and Housing Census, the population of this district is about 144,332 making up 6.6% of the region's total population. About 55% of the population is female and it has an 81% dependency ratio. In the municipality, 39,462 women in the reproductive age have

giving birth to 77.892 children. On average, the household size is about 3.8 persons per household. Thirty-nine percent of the population over the age of twelve years or older were married. Of the people aged eleven years and above, seventy-seven (77.4%) percent of them are literate. Of the population in the municipality, 26.6% are involved in skilled agriculture, forestry and fishery work (GSS, DANIDA, & DFATD, 2014).

Ekumfi District: To the north of this district is Ajumako/Enyan/Essiam District, west of it is Mfantiman district, and to the south lies the Gulf of Guinea and then east by Gomoa East District. It has a population of 52,231 which makes approximately 2.4% of the population of the regions. Its female population is around 53.8% and with a dependency ratio of 103.0. The district has a total fertility rate of 4.0 and an average household size of 4.1 persons per household. The fourth person out of every tenth (42.5%) within the age of twelve and above is likely to be married with six out of every ten (64.7%) women between the ages 25-29 being married also. The district has a literacy level of 66% for every person eleven years and over. Skilled agricultural, forestry and fisheries work is the occupation of over fifty (52.3%) percent of the district population (GSS, DFATD, & DANIDA, 2014).

3.4 Study population

The population considered for this work was all the female participants of the invisible fisher's pilot intervention, community project volunteers for the project in the twelve communities the project took place in, the project field officers, regional and district fisheries representatives in each region and a representative from Viamo, the company in charge of sending out the calls.

3.5 Inclusion and exclusion criteria

Type of interview	inclusion	Exclusion
Focus Group Discussion	1. Female participants who fall between the ages of 15-49 years for the focus group discussions.	Women above fifth (50) years
In-depth interviews	1. Either male or female directly or indirectly involved in the Invisible fishers project	

3.6 How participants were selected

Three focus group discussion (FGD) comprising of six to eight participants was carried out in each region. One FGD per treatment arm of the project was selected to ensure a diversity of experiences. In-depth interviews (IDIs) including 17 participants was conducted. The IDIs comprised of one participant each from the other six communities of each treatment arm. Six field volunteers across treatment arms (three from each region), one project officer from each region, one district fisheries representative from each region and a representative from Viamo were interviewed in the IDI. The other interviewees other than the participants interviewed were for the purpose of collaborating and explaining reports made by the participants. Selection for the FGDs was done as to who was available and willing to take part in the discussion when the researcher got to the communities.

For the IDIs of the other six communities with no FGDs, a name was picked at random from each community from a register of the participants kept by the project officers. The selection of the volunteers was done as to who was available when the researcher got to the community for the discussions and interviews. Three volunteers were selected per region but only two were available to be interviewed in the Central region. One project staff in each of the regions participated in the study. Representatives of the Fisheries Commission in each participating region were included. These representatives were identified with the help of the IF project staff. One IDI was also performed with a representative from Viamo. In all, fifty- six participants were included in this study. All the participants were called by phone a day or two ahead of the scheduled date for the FGD or IDI. All, except three of the interviews, were done face-to-face.

3.7 Data collection

3.7.1 Data collection tools

The FGDs and in-depth interviews were conducted by an independent researcher who was not part of the Invisible Fishers pilot project. The researcher is a female master's students at the school of public health and is a dietician by profession. The researcher had some training in qualitative work during both her undergraduate and master's studies. The interviewer did not know the interviewees of this current study. The participants were however made known that she will be coming around to interview them two days before the interview dates. Since the researcher had no prior relationship with the participants, no bias or assumptions were made on the part of the researcher.

A semi-structured questionnaire was used to collect the socio-demographic characteristics of the participants. Pretested interview guides were used during the IDIs. Each tailored to the respective respondent. An FGD guide was used to facilitate the FGD. The FGD guide asked questions on participant knowledge, understanding, and experiences of the IF intervention as well as barriers against participating fully in the communication intervention.

3.7.2 Focus group discussion

A total of six FGDs, each comprising of six to eight participants, were held across the two regions, three focus groups in each region. FDGs one (1) to three (3) took place in the Volta region and four (4) to six (6) in the Central region. The FGDs were arranged with the help of community field volunteers. The FGDs were facilitated by the principal researcher (student). The questions and responses were translated into either Fante or Ewe during the FGD by an interpreter.

The researcher was aided by two assistants in all of the discussions whose purpose was to take notes of what transpired and capture nonverbal responses, cues, and other interactions. Informed consent was obtained from all the participants prior to data collection. Obtaining consent involved providing information and the procedures of the study, as well as a request to capture the discussion using a digital audio recorder. Discussions lasted for a maximum of forty-five minutes. Incentives (pieces of cloth) were given to every participant. In the Central region, the project officer sat in FGDs as the participants were more comfortable with her around but the IDIs were done without her. In the Volta region the project officer did not partake in either the IDIs or FGDs.

3.7.3 In-depth Interview

A maximum variation sampling was used to select participants for the IDI. Four different interview guides were used to collect data for the IDIs at the beginning. One for participants in the other six communities of each TA, another for field project officers and volunteers. In the course of interviewing the volunteers, it was noticed that the interview guide being used was not suitable for them as they only had knowledge pertaining to the treatment arm the community was on. The researcher developed another interview guide for volunteers. One guide was used for the fisheries representatives and a final one for the Viamo (Call Company) representative, making five interview guides in the end. For volunteers in communities where an FGD was done, the interview took place right after the discussions. In other communities, the volunteers were interviewed first, after which, the selected participant from the community was also interviewed. Mostly, the interviews took place in the participant's homes, workplace, or elsewhere in the community, which minimized noise and offered privacy.

3.7.4 Data management

Field notes were made promptly after each discussion and interview and transcribed into a data document. The field note covered the underlying interviewee's responses to the meeting, and any important perceptions, for example, the attitude of the respondent, body language and emotions that were not captured by the digital recording. Data gathered were stored on the personal computer and drop-box of the researcher with restricted access to the investigation team. The data is to be stored for a period of two years after which it will be discarded.

3.8 Data analysis

The audio records were transcribed by two independent assistants and compared for consistency. All inconsistencies were discussed with a third person as well as utilizing field notes to confirm the final version of the transcribed data. The transcripts were read several times and used to generate codes and themes related to participant understanding of and perception, knowledge, experiences, and barriers to participating in the project. Coding was performed using text analysis software, NVivo (version 11).

A thematic analysis was utilized, employing an inductive and deductive investigation (Creswell, 2009). A codebook was created based on the study objectives. Every transcript was reviewed in the NVivo software. The researcher opted to conduct a content analysis of the data gathered. This was realized by identifying the main themes that emerged from the transcriptions of the IDIs and the FGDs. The researcher quoted extensively in verbatim format from the transcripts in particular.

3.9 Ethical considerations

3.9.1 Approval and clearance

Approval was sought from the Ethics and Protocol Review Board of the Ghana Health Service, prior to all research procedures.

3.9.2 Voluntary written informed consent

The consent of the participants was obtained before interviews were conducted. The research team continued to provide information during the study to participants as and when it was deemed necessary.

3.9.3 Confidentiality and data quality control

Information obtained from the participants was kept confidential by being available to only the researcher and her supervisor. Subjects were given unique identifiable codes during the study to facilitate easy tracking. A soft copy of data generated relating to the research was saved electronically and password protected.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

The findings of the study are presented in this chapter. The demographic characteristics of the participants are presented in a table. In all, ten (10) themes were identified. Sub themes under the main themes were presented as paragraphs under the main themes.

4.2 Characteristics of Participants

Forty (40) female beneficiaries of the IF Project participated in the FGDs. Two were below 29 years; the rest were split equally between ages 30 to 39 (n=19), and between 40 and 49 (n=19). Almost all (n=39) were Christians. A majority (33 participants) were married. Sixteen (16) participants had no formal education. Nine had only Primary education and fifteen (15) had education up to Junior High level. There were 16 participants in the IDI. Majority were between ages 30 and 49 (n=13). Most (n=12) were females and all were Christians. Thirteen were married. Five respondents had Primary level education; five had Junior Secondary level education and the rest had tertiary level education.

Table 1 Demographic characteristics of participants

Demographic characteristics	FGD (N= 40)	IDI (N= 16)
AGE		
20-29	2	3
30-39	19	7
40-49	19	6
Sex		
Male	-	4
Female	40	14
Religion		
Christian	39	16
Muslim	1	-
Education		
No school	16	-
Primary	9	5
JSS	15	5
Tertiary	0	6
Marital status		
Married	23	13
Single	2	3
Widow	3	-
Divorced	2	-

4.3 Perception about the IF Project

The women participants expressed varied perceptions of what the project was about before their enrollment as participants. Most women indicated they enrolled in the intervention without having a complete understanding of the project. They explained that they only enlisted because they were asked to by the project implementers. Subsequently, those whose names had been written down were enrolled in the intervention.

4.3.1 Perception regarding health

Participants from TA1 and TA3 communities mostly indicated the project was about their health and well-being. While some said the intervention was about anemia, others thought it was about their diet and the foods they are to eat to stay healthy. Some also believed it was about, personal and environmental hygiene. The common trend through all responses, however, was that it was about their health.

4.3.2 Perception regarding business

Because TA2 participants received business-related messages and input, together with the behavior change communication, their predominant perception of the project was that it is seeking to help improve their business. However, they also indicated its benefit for their health.

Across the project arms, the women indicated that although at the beginning, they had a different perception of the project, during the intervention implementation, they had a better appreciation of its intent; that it was about their health, and particularly about addressing anaemia, improving their diet and controlling malaria.

4.4 Importance of the IF Project

There was a general perception that the project was considered beneficial to participants. Participants indicated that the messages on anaemia, diet, and malaria were helpful to them and their families. Some women reported that prior to their participation in the project, they and their families were ill frequently, without knowing why. However, the project helped them to recognize the importance of malaria, diet, and anaemia in their lives, and business, and how to control these. One participant noted,

“It has brought a complete change into our lives because before we got their messages, we did not know how to go about our businesses and what to eat but when they came with their messages and teachings, we saw a big change.” (TA2 Participant)

Thus, participants attributed the improvement in their diets, personal hygiene, and environmental sanitation to their participation in the project. Also, because of their participation, the women reported that their children were healthy and fit to go to school. Further, they were healthy to smoke their fish and as a result, able to go to the market to sell their produce.

4.4.1 Importance to their business

The women also linked the project to a reduction in the number of times they visited the hospital. Thus, the saved time from going to the hospital was spent either to smoke their fish or go to the market to sell fish. Also, they are not able to invest the money they would have used to pay hospital bills on their business and hence make more profit. All the responses

from both IDI and FGD, demonstrate that the women found the messages they received through the project beneficial and important for them, their family, and their business.

“But since IF, project all those things has stopped and now I can channel that money into my work. I have seen my work is progressing.” (TAI Participant)

4.5 New knowledge acquired

The women reported a range of areas in which they have gained new knowledge.

The women reported they gained knowledge on the meaning of anemia and its determinants (including infections, diets, and hygiene). Regarding diets, the knowledge reported includes increasing women’s portion of anemia source foods during meal sharing at home. They also reported that due to the peculiar needs of women (monthly menstruation); they are more susceptible to anemia than their male counterparts. Hence the need to increase their share of anemia source foods. They learned foods such as meat, fish, eggs, fruits, and vegetables such as orange, and kontomire can prevent one from getting anemia.

Regarding hygiene, they indicate there is a need for them to cover their water storage containers, and wash their hand and utensils before and after each meal. They reported correctly, the need to practice personal hygiene by keeping their homes and clothes clean at all times.

Preventing mosquito bites as a way to prevent malaria and anemia was one of the reported knowledge outcomes. The women expressed the need to keep a clean environment by weeding around their homes, draining stagnant waters, and emptying any containers with water that can act as a source of a breeding ground for mosquitoes. They correctly indicated

that by keeping proper personal hygiene and sanitize the environment, they would be able to prevent infections and increase household income.

Knowledge about income and business was also reported. Improved knowledge of customer relations was one of the new knowledge reported. They explained that treating a customer appropriately will make them happy and yield more business from the customer's references. Also, smoking their fish well and keeping their market stall tidy will draw customers to the stall. By so doing, they will be able to make more profit and attain financial security.

Some misconceptions held by the women were they were to give the men fewer anemia sourced foods. Some believed that if you leave a cup lying around for mosquitoes and flies to hover around it, you can get malaria. Apart from this, all knowledge reported was factual.

Across treatment arms, knowledge about anemia, its causes and prevention, proper diet, keeping a clean environment and malaria control were reported by the women. However, women in TA2 added a business angle to new knowledge acquired. Below is a collation of quotes illustrating participants' knowledge from participating in the IF Project:

"We knew women were not supposed to eat more meat than the men when we cook. But through their messages, we've come to know that women are supposed to eat a lot of meat than the men. We also know that if you don't have enough blood you get anemia. That meat gives a lot of blood. We now know that women lose more blood than men so we are more prone to anemia". (TA1 Participant)

"I went to the hospital and told me I had anaemia and that I should eat well but they did not tell me what I should eat. But because I was part of this program I got to know what I should so that the anaemia goes and even slept under the mosquito net they give me at the hospital."
(TA1 Participant)

“What I learnt is that when you treat a customer well, speak to them well and serve them with good fish, they will bring you more customers. When somebody ask them where they bought it, they will say I bought it from my friend.” (TA2 Participant).

“I have picked something about my health, the things I will do not to get sick. To keep ourselves from mosquitoes by always sleeping in mosquito nets, to keep us from contracting malaria which will indirectly affect our money issues.” (TA3 participant).

“You leave a cup there and mosquitoes will hover over it and you go to use it, flies will be in plates and we go to use it, all these will give you malaria”

4.6 The influence of learning on Participants’ lives

Participants reported changes they have made in their lives due to new knowledge acquired from the IF intervention. In regards to their diet, the women reported adding animal source foods such as meat and some of their smoked fish to the foods they prepare. Also, they and their female children were now taking the majority of the animal source food and vegetables in the meals prepared.

With regards to hygiene, they reported washing of hands before and after eating. Also, they now washed their hands, the smoking nets, and the fish at least twice before they start the smoking process. They had started making sure that they and their family members, especially the children, keep on their footwear all the time, especially during the raining season. The women reported how they first arrange the fish on the net rails before taking them to the oven to avoid smoke inhalation. The women reported keeping a clean and sanitized environment

and making sure their neighbours also do the same to prevent mosquito breed. They had started weeding around their houses, covering all water barrels and containers, throwing wastewater especially washing water during their menstrual period very far away from their homes.

Regarding business, the women reported having stopped borrowing money, unnecessarily, and saving the little money they have. Also, they had stopped making unnecessary expenses and directing the monies back to their business for expansion.

TA3 participants talked about influences made in their lives with regards to smoking processes such as not standing around the oven during the smoking process. TA2 participants reported mainly on how the project has influenced borrowing and saving of money, and TA1 participants focused on the changes made in their diet and personal hygiene as a result of their participation in the IF project as indicated in the quotes below:

“In the past when we go for the fish, we don’t wash our hands or wash the metal used in grilling. We just start grilling but since the intervention now when we go for the fish we first of all wash our hands, the fish and the metal used for grilling the fish before we add the fish for grilling.” (TA3 Participant)

“Now when I cook I take more of the meat and stews for my children and I because I learned that I need more meat so I don’t get anaemia because I loose blood every month and also the children needs the meat to grow. Also I give more meat to the girl now than the boys” (TA1 Participant)

“There has been a change, now I have my own money that I can use to purchase what I want without borrowing and also another change is in my eating, now we eat well and we are mindful of what we eat. We have realised that when there is meat on the food you eat it is good and very nutritious and you will gain a lot of blood too”. (TA2 Participant)

“When you speak to them you will realise that they never knew all those symptoms they were having were even anaemia. So definitely straight away you could say it really influenced them and the community”. (MFA Participant, Central region)

4.7 Experiences of participants

Overall, participants had positive experiences of participating in the IF project. All the participants enjoyed receiving the voice calls from the IF intervention, particularly the convenience of receiving the calls and flashing back at their homes. They reported liking the calls and having the meetings happening at the time of their choosing. Some also expressed the fact that they liked experiencing ‘school life’ during the bi-weekly meetings, as they never had the opportunity to attend school. Some voiced that the Intervention (the calls and meetings) came at the time they were most in need of the anemia education hence was a nice experience for them.

“My mobile phone is always with me and so when I am not busy I just flash and they will call me back to give me my message which was very nice and helpful as it did not interrupt my work” (TA3 Participant).

“I liked experiencing how school life would have been like if I had been to school, as during the meetings we taught as if we were in school” (TA2 Participant)

A few participants in the Volta region reported that the meetings inconvenienced them as the meetings were called at the times they were at the market. This inconvenience was explained by the Project officer for the region. In her explanation, the meeting times were chosen by the majority of the group hence affecting the minority who were unable to voice out their opinions. There was not much variation in the experiences across the treatment arms.

“Sometimes when there is a meeting it is also a market day at Kpando, due to that we have to pick a vehicle from Kpando to the meeting and return afterwards, in such cases we waste money.” (TA1 Participant)

4.8 Desirability of calls and meetings

Depending on the treatment arm, the participants received calls between two to four times a week. Mostly, participants from TA1 and TA3 said they had the calls twice in a week (Mondays and Fridays) and those in TA2 said they had the calls at least thrice in a week (Monday, Wednesday and Friday). Most participants indicated that they were happy with both the meetings and calls. They were happy with the ease with which they could answer the calls and how messages in the calls they couldn't understand were explained to them during the meeting days.

There was a unanimous response to whether they liked the calls. Some women requested more frequent calls; only a few wanted the number of calls per week to remain the same. But with the bi-weekly meetings, most wanted it to remain the same number of times if not reduced to once a month. All participants did not want to choose between the calls and weekly meetings and wanted both. But upon further probing, all but one of the participants said they would choose the calls over the meetings.

“I would choose the calls as its less time consuming and that during the meetings they sometimes waste time as everyone has to express their opinion”. (TA3 Participant)

“If there is a call back option for questions to be asked and answered then I would prefer the calls only”. (TA1 Participant)

“Yes if they can make the meetings once in every month we all will be available, because with the every two weeks it is time consuming as we sometimes go to the market or sea shore.”
(TA2 Participants)

4.9 Challenges, Barrier and Facilitating factors to the intervention

The majority of participants indicated they had no difficulties receiving the calls and participating in the meetings. Participants rejected the idea that calls were deliberately avoided. There were reasons given for missed calls, including phones being in the custody of husbands, phones were put off when being recharged, damage to the phone, or the phone is misplaced. Participants in the Volta region had network problems throughout the intervention in addition. Sometimes, they simply forgot to call back.

Although the program had a flash-call back component for missed calls, they were unable to call back as requested because they may not have call credits. The Viamo representative who worked closely with the women to set up the calls validated the reasons given for dropped calls similar to challenges during the process of sending out the calls.

“It is about the phone; it might be off. When it is off, it might be placed on charge so whiles it will be charging that might be the time of calling so you make sure that after the phone has been fully charged you call them back” (TA1 Participant)

“It might also be the case that the phone has broken down.” (TA3 Participant)

“Sometimes you don’t have credit to flash and when you get the credit you might forget to call back”. (TA1 Participant)

“The women, some of them were misplacing their phones and some their SIM cards and stuff, other were also leaving the phones with their husbands. They will do this and we will get to hear of it after a week or two or three.” (Viamo stuff)

Although some barriers were encountered, the women reported that the convenience and ease with which they received the intervention facilitated in the uptake of the intervention. They explained that since they did not have to go to a health centre for the information they were getting, it made partaking in the intervention easy for them due to the reduced cost of consultation and transportation.

4.10 Recommendations for enhancing learning experience

Irrespective of the treatment arm, participants requested funding for their business. TA1 and TA3 participants requested for loans in addition to the messages whiles TA2 participants

asked for more funding support than was provided. Almost all participants had interest in getting funding and whenever they had the opportunity, they raised this issue.

There was a consensus that almost every aspect should be left as it is but if the project could also teach them about good farming methods that will be welcomed. The MFA staff requested for more Ahoto ovens and prior education on fish smoking to the women.

“They shouldn’t change anything, the messages and call frequencies are good.” (Viamo staff)

“As for now what they should add that will make us happy is money.” (TA1 Participant)

“They should increase the money.” (TA2 Participant)

CHAPTER FIVE

5.0 DISCUSSIONS

5.1 Participants Perception

Although the participants were not well informed about the project at the beginning, they perceived it was going to be about something beneficial to them hence their willingness to participate. After participating in the study, reports indicated that the women had positive perceptions of the study. This was because they enjoyed participating in the study and believed anaemia is of importance to them, their family and work.

Similar findings can be found in the work by Shet et al, (2017) where lay workers' perception of an anaemia control intervention in Karnataka, India influenced the teachings given to mothers on anaemia control. Hence importance should be placed on giving people complete knowledge on their health or any intervention they partake in to facilitate their knowledge on its importance and the correct perception for them to develop an interest in the intervention.

5.2 Knowledge acquisition

The results of the study show that participants obtained new knowledge and demonstrated same regarding anaemia, its symptoms and the standard preventive mechanisms for addressing this menace. For instance, participants widely acknowledged that anaemia is a blood-related ailment. The level of knowledge expressed by participants is in sync with information on the same subject as presented in the “Health Worker Training Manual for Anaemia Control In Ghana”, a manual prepared in a collaborative effort by Spring, USAID and the Ghana Health Service to equip Ghanaian health workers with the requisite knowledge

and skill required to educate and counsel the masses, with the aim of combating the spread of anaemia. (GHS & SPRING/Ghana, 2017). It is also interesting to note that not only does the knowledge exhibited by participants agree with those addressed in the manual, but the scope of information regarding anaemia, particularly the body of knowledge to be communicated to target audiences by facilities. This shows the extent of work that was done by project implementers to ensure that the requisite body of knowledge was communicated to participants over the nine-month period of the IF Project.

5.3 Changes made

Participants acknowledged having acquired new knowledge which evidently effected substantial changes in their lives and circumstances. Changes identified include the adoption of hygienic practices, changes in diet and in cooking practices among others. These changes resulted in less money spent on seeking treatment for anaemia patients, thus affording some participants the rare opportunity to channel such funds that would have hitherto gone into seeking healthcare into their businesses and several other effects of the resultant changes in attitudes and behaviours. These demonstrate the value of communication/education as a means of promoting positive health practice and engendering positive behaviour change. This point is further corroborated by a wide body of studies conducted into varied health-related educational/communication campaigns conducted in many parts of the globe. Health-related communications campaigns cited by health-focused researchers such as Baizhumanova, et al. (2010), Creedon (2005), Green, et al. (1980), Ingrand, et al. (2004), Ajzen & Fishbein (1980), Yzer, Siero & Buunk (2000) and Peretti-Watel et al. (2005) point to some degree of positive change in knowledge acquisition, attitudes and behaviours engendered by health-related

communications campaigns and their resultant positive impact on the prevalence of certain health risks.

5.4 Effectiveness of channels of communication

The participants unanimously agreed the communication strategies used were desirable and easy to uptake. This means that the project approach of using audio messages through the phone and weekly meetings was feasible and could work on a large scale. However, the women preferred the phone calls to the meetings. Thus the mobile phone approach is likely to be more successful. A couple of studies have been conducted to ascertain the best communication channels to reach Ghanaians, especially in relation to the dissemination of health-related information. In a study on the implementation of a vitamin regimen in a Ghanaian village, one of the significant findings related to the best means of communicating with rural Ghanaians. Overall, it was determined that radio is the best way to communicate because, although many Ghanaians do not personally own a radio, most have access to one. Additionally, it was found that radio, town criers, posters, church, mosque and market announcements, loudspeaker vans and were more popular and effective channels of health communication than community groups, television, movies, videos, healthcare personnel, billboards, newspapers and schools (Hill et al., 2007). The success recorded in the implementation of the IF Project that saw participants get actively involved, attend group meetings and express positive views about the project points to a significant mismatch between the effectiveness of the communication channels employed in the IF Project implementation and the findings from the earlier study cited that essentially downplayed

health communication channels such as community groups and projected communication via radio among others.

5.5 Challenges, barriers and facilitating factors

The women had easy access to mobile phones and hence the intervention could reach them any time. The women not having to go to a health centre for the intervention but at the comfort of their homes served as a facilitating factor because virtually no expenses were made on transportations and consultation fees. This finding is similar to that found in the use of mobile phones to communicate intervention on maternal and neonatal emergency intervention in rural Bangladesh (Huq, Koehlmoos, Azmi, Quaiyum, Mahmud, Hossain., 2012). Though the regular group meetings were generally well attended over the course of the project, communication via mobile phones occasionally proved unreliable since it was sometimes difficult to reach some participants. Some of the reasons given by participants included but were not restricted to the issue of faulty mobile phones and the phones being in the custody of some husbands, switched off phones and network issues. Yet another notable challenge had to do with some participants' failure to return calls from project implementers. These challenges as clearly identified relate to one particular channel of communication, the mobile phone. These challenges and barriers were similar to that found by Huq, et al. (2012) in their intervention to reduce maternal mortality and morbidity via mobile phones. These barriers could be due to the communities being in the rural setting hence technological, electricity and mobile access pathway challenges.

5.6 Healthcare Communications Campaigns

A good case can be made for incorporating a strong communications element/campaign into health programs/interventions intended to stem the tide of certain ailments many communities are contending with. Reports gathered from this work showed that communication played a major part in the implementation of the IF Project; it was for the most part a healthcare communications project with a distinct focus on the prevention of anaemia amongst women in twelve (12) communities within the Volta and Central regions of Ghana as earlier indicated. Participants acknowledged having acquired new knowledge which evidently effected substantial changes in their lives and circumstances. Changes identified include the adoption of hygienic practices, changes in diet and in cooking practices among others. These changes resulted in the women reporting having fewer cases of recorded anaemia cases, less money spent on seeking treatment for anaemia patients, thus affording some participants the rare opportunity to channel such funds that would have hitherto gone into seeking healthcare into their businesses and several other effects of the resultant changes in attitudes and behaviours. These demonstrate the value of communication/education as a means of promoting positive health practice and engendering positive behaviour change. This point is corroborated by a wide body of studies conducted into varied health-related educational/communication campaigns conducted in many parts of the globe. Health-related communications campaigns cited by health-focused researchers such as Baizhumanova, et al. (2010), Creedon (2005), Green, et al. (1980), Ingrand, et al. (2004), Ajzen & Fishbein (1980), Yzer, Siero & Buunk (2000) and Peretti-Watel et al. (2005) point to some measure of positive change in knowledge acquisition, attitudes and behaviours engendered by health-related communications campaigns and their resultant positive impact on the prevalence of certain health risks.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This study was conducted to investigate the knowledge, perception, and experience of participants in the Invisible Fisher`s Intervention (IF Project) in the Volta and Central regions of Ghana. The researcher obtained data from both direct participants of the IF project and others also involved but not as participants, adopting a qualitative approach to the study that necessitated the use of in-depth interviews and focus group discussions in obtaining data. The data gathered were presented and discussed, employing various qualitative tools available to the researcher. This chapter basically concludes the study, presenting a summary of the findings and recommendations for both practices and for further studies.

6.2 Summary of Findings

Varied perceptions were held by beneficiaries of the IF Project prior to the commencement of the implementation process. Most participants expressed perceptions that generally indicate that they did not have enough knowledge before the commence of the IF Project. These perceptions changed from them not having complete knowledge of anaemia to having knowledge on anaemia (causes, diet, and prevention) over the course of the project implementation process. They demonstrated an understanding of what the IF Project was about and what it was intended to achieve by the end of the intervention. Participants in the IF Project variedly demonstrated the knowledge acquired especially about anaemia, its causes,

and prevention. A significant amount of new high-value knowledge was acquired over the course of the project.

Respondents were certain the knowledge acquired over the course of the implementation process had made a difference in their circumstances. It was acknowledged that the project was well received by the participating communities. Beneficiaries were generally agreed that the IF Project had impacted their lives positively. Many participants narrated the benefits of their participation in the IF Project. These included good health, good eating habits/diet, hygienic practices for the participants themselves and their families, particularly their children. They held that this project was largely helpful and brought about positive outcomes. With respect to the challenges encountered over the course of project implementation, it was found that some barriers like phone switched off were encountered occasionally, particularly with respect to information dissemination. Phones of some participants getting missing or stolen; some phones getting damaged (becoming faulty) and some participants leaving their phones with their husbands among others. Beneficiaries unanimously agreed they like the calls and bi-weekly meetings. There was a general request for financial support packages, aside from the education they are given.

6.3 Recommendations

6.3.1 Recommendations for practice

The following recommendations are informed by the findings of this study:

- ✚ It is recommended that the IF Project be scaled up to include other communities in the country that is burdened with a high prevalence of anaemia.

- ✚ Measures should be put in place to make up for the shortfalls and challenges that were encountered during the roll out of the IF Project. This should inform how communications are managed in other health-related communications campaigns/projects in the future.

6.3.2 Recommendations for further studies

The recommendations for further studies are itemized below are essentially informed by the data engaged with over the course of this study and by the findings of this study.

- ❖ It is recommended that further research be conducted into assessing the effectiveness of the IF Project, employing not only qualitative methods such as interviews and FGDs but also quantitative methods such as surveys as well as the conduct of laboratory testing of blood samples among others. Other advanced models could be adopted in such a study to make findings more rigorous and easily verifiable.

REFERENCES

- Accrombessi, M., Ouédraogo, S., Agbota, G. C., Agbota, R., Massougbdji, A., Menéndez, C., & et al. (2015). Malaria in pregnancy is a predictor of infant haemoglobin concentrations during the first year of life in Benin, West Africa. *PLoS ONE*, *10*, e0129510.
- Addis, A. K., & Mohamed, D. A. (2014). Prevalence of anemia and associated factors among pregnant women in an urban area of eastern Ethiopia. *Anemia*. doi:10.1155/2014/561567.
- Agbaje, O. A., Adeyomoye, A. A., Omidiji, O. A., Oboke, O. S., & Afolabi, B. B. (2018). Evaluation of Umbilical Artery Doppler Indices in Pregnant Women With Sickle Cell Anemia Disease at a Nigerian Tertiary Hospital. *Journal of Diagnostic Medical Sonography*, *34*(6), 466-478.
- Albertson, L. A. (1977). Telecommunications as a travel substitute: Some psychological, organizational, and social aspects. *Journal of Communication*, *27*, 32-43.
- Allen, L., de Benoist, B., Dary, O., & Hurrell, R. (2019, January 24). *World Health Organization, Food and Agriculture Organization. Guidelines on food fortification with micronutrients*. Retrieved from World Health Organisation: <http://apps.who.int/iris/bitstream/10665/43412/1/9241594012-eng.pdf>
- Asobayire, F. S., Adou, P., Davidsson, L., Cook, J. D., & Hurrell, R. F. (2001). Prevalence of iron deficiency with and without concurrent anemia in population groups with high prevalences of malaria and other infections: a study in Côte d'Ivoire. *Am J Clin Nutr*, *74*, 776-782.
- Boulos, M. N., Wheeler, S., Tavares, C., & Jones, R. (2011). How smartphones are changing the face of mobile and participatory healthcare: An overview, with example from eCAALYX. *Biomed Eng Online*, 10-14.
- Brousseau, D. C., Panepinto, J. A., Nimmer, M., & Hoffman, R. G. (2010). The number of people with sickle cell disease in the United States: national and state estimates. *Am J Hematol*, *85*(1), 77-78.
- Cairncross, F. (1997). *The death of distance* Harvard Business School Press.
- Calabrese, F., Smoreda, Z., Blondel, V. D., & Ratti, C. (2011, July 13). Interplay between Telecommunications and Face-to-Face Interactions: A Study Using Mobile Phone Data. *PLoS ONE*, e20814. doi:10.1371/journal.pone.0020814
- Cartwright, G. E., & Wintrobe, M. M. (1962). Anemia of infection. *Adv Intern Med*, *5*, 165-226.
- Choo, S., Lee, T., & Mokhtarian, P. L. (2010). Do transportation and communications tend to be substitutes, complements, or neither? U.S. consumer expenditures perspective, 1984-2002. *Transportation Research Record*, 121-132.
- Colah, R. B., Mukherjee, M. B., Martin, S., & Ghosh, K. (2015). Sickle cell disease in tribal populations in India. *Indian J Med Res*, *141*(5), 509-515.
- Creswell, J. W. (2009). Research design: Qualitative, quantitative and mixed methods approached. *Research design: Qualitative, quantitative and mixed methods approached*, 260.

- Desai, M., ter Kuile, F. O., Nosten, F., McGready, R., Asamoah, K., Brabin, B., & et al. (2007). Epidemiology and burden of malaria in pregnancy. *Lancet Infect Dis.*, 7, 93–104.
- Ekong, & Anietie. (2017). Sickle cell disease. *InnovAiT*, , 10(2), 73–81. doi:10.1177/1755738015626186
- Estabrooks, P. A., Shoup, J. A., Gattshall, M., Dandamudi, P., Shetterly, S., & Xu, S. (2009). Automated telephone counseling for parents of overweight children: A randomized controlled trial. *Am J Prev Med*, 36, 35–42.
- Ezeamama, A. E., Friedman, J. F., Olveda, R. M., Acosta, L. P., Kurtis, J. D., Mor, V., & McGarvey, S. T. (2005). Functional Significance of Low-Intensity Polyparasite Helminth Infections in Anemia. *The journal of Infectious Disease*, 192(12), 2160–2170.
- Fjeldsoe, B. S., Marshall, A. L., & Miller, Y. D. (2009). Behaviour Change Interventions Delivered by Mobile Telephone Short-Message Service. *American Journal of Preventive Medicine*, 36(2), 165–173. doi:10.1016/j.amepre.2008.09.040
- Free, C., Whittaker, R., Knight, R., Abramsky, T., Rodgers, A., & Roberts, I. G. (2009). Txt2stop: a pilot randomised controlled trial of mobile phone-based smoking cessation support. *Tob Control*, 18, 88–91.
- Free, C., Knight, R., Robertson, S., Whittaker, R., Edwards, P., Zhou, W., . . . Roberts, I. (2011). Smoking cessation support delivered via mobile phone text messaging (txt2stop): a single-blind, randomised trial. *Lancet*, 378, 49–55. doi:10.1016/S01406736(11)60701-0
- Getachew, M., Yewhalaw, D., Tafess, K., Getachew, Y., & Zeynudin, A. (2012). Anaemia and associated risk factors among pregnant women in Gilgel Gibe dam area, southwest Ethiopia. *Parasites Vectors*, 5(1), 296.
- GHS, & SPRING/Ghana. (2017). *Health Worker Training Manual for Anaemia Control in Ghana. Facilitators Guide*. Arlington, VA: Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project.
- Gilgen, D. D., Mascie-Taylor, C. G., & Rosetta, L. L. (2001). Intestinal helminth infection, anaemia and labour productivity of female tea pluckers in Bangladesh. *Trop Med Int Health*, 6, 449–57.
- GSS, DANIDA, & DFATD. (2014). *2010 Population and Housing Census. District Analytical Report, Kpando Municipality*. Accra: Ghana Statistical Service. Retrieved from www.statsghana.gov.gh
- GSS, DANIDA, & DFATD. (2014). *2010 Population and Housing Census. District Analytical Report, Mfantiman District*. Accra. Retrieved JUNE 4, 2019, from :www.statsghana.gov.gh.
- GSS, DANIDA, & DFATD. (2014). *2010 Population and Housing Census. District Analytical Report: South Dayi District*. Accra: Ghana Statistical Service. Retrieved june 4th, 2019, from www.statsghana.gov.gh
- GSS, DFATD, & DANIDA. (2014). *2010 Population and Housing Census. District Analytical Report, Ekumfi District*. Accra: Ghana Statistical Service. Retrieved JUNE 4, 2019, from : www.statsghana.gov.gh.

- GSS, GHS, & ICF. (2015). *Ghana Demographic and Health Survey 2014*. Rockville: Ghana Statistical Service, Ghana Health Services, ICF International.
- Herrmann, W. (2011). *Vitamins in the prevention of human diseases*. Berlin: Walter de Gruyter. Retrieved from <https://books.google.it/books?id=b9ahvNjPFO8C&pg=PA245>
- Hunt, A., Harrington, D., & Robinson, S. (2014). Vitamin B12 deficiency. *The BMJ*, 349 , g5226. doi:10.1136/bmj.g5226
- Huq, N. L., Koehlmoos, T. L., Azmi, A. J., Quaiyum, M. A., Mahmud1, A., & Hossain, S. (2012). Use of mobile phone: Communication barriers in maternal and neonatal emergencies in rural Bangladesh. *International Journal of Sociology and Anthropology*, 4(8), 226- 237. doi:10.5897/IJSA11.134
- ITU. (2009, OCTOBER). *The World in 2010 ICT Facts and figures 2010*. Retrieved october 17, 2018, from International Telecommunication Union: . http://www.itu.int/ITU-D/ict/publications/idi/2010/Material/MIS_2010_without%20annex%204-e.pdf
- Kassebaum, N. J., Jasrasaria, R., Naghavi, M., Wulf, S. K., Johns, S., Lozano, R., . . . Murray, C. J. (2014, january). A systematic analysis of global anemia burden from 1990 to 2010. *Blood*, 123(5), 615-24.
- Kaur, M., & Kochar, G. K. (2009). Burden of anaemia in rural and urban Jat women in Haryana state, India. *Mal J Nutr*, 15, 175-84.
- Koenker, H., Keating , J., Alilio, M., Acosta , A., Lynch, M., & Nafo-Traore, F. (2014). Strategic roles for behaviour change communication in a changing malaria landscape. *Malaria Journal*, 13(1).
- Koury, M. J., & Ponka, P. (2004). New insights into erythropoiesis: the roles of folate, vitamin B12 and iron. *Ann Rev Nutr*, 24, 105-131.
- Lachner, C., Steinle, N. I., & Regenold, W. T. (2012). The neuropsychiatry of vitamin B12 deficiency in elderly patients. *The Journal of Neuropsychiatry and Clinical Neurosciences.*, 1, 5-15. doi:10.1176/appi.neuropsych.11020052
- Low, M. S., Speedy, J., Styles, C. E., De-Regil, L. M., & Pasricha, S. R. (2016). Daily iron supplementation for improving anaemia, iron status and health in menstruating women (Review). *Cochrane Database of Systematic Reviews*, 4, 8. doi:DOI: 10.1002/14651858.CD009747.pub2.
- McLean, E., Cogswell, M., Egli, I., Wojdyla, D., & de Benoist, B. (2009). worldwide prevalence of anaemia, WHO vitamin and mineral nutrition information. *Public Health Nutrition*, 12, 444–54.
- Milman, N. (2011). Anemia—still a major health problem in many parts. *Ann Hematol*, 90, 369-377.
- Mok, D., Wellman, B., & Carrasco, J. (2010). Does distance matter in the age of the internet? *Urban Studies*, 47, 2747–2783.
- Mulumba, L. L., & Wilson, L. (2015). Sickle cell disease among children in Africa: an interactive literature review and global recommendations. *Int J Afr Nurs Sci*, 3, 56–64.

- Ndiay, N. F., Idohou-Dossou, N., Diouf, A., Guiro, A. T., & Wade, S. (2018). Folate Deficiency and Anemia Among Women of Reproductive Age (15-49 Years) in Senegal: Results of a National Cross-Sectional Survey. *Food and Nutrition Bulletin, Sage*, 39(1), 65-74.
- NIH. (2016). *Dietary Supplement fact Sheets: Vitamin B12- Health Professionals Fact Sheet*. National Institute of Health. Retrieved from <http://ods.od.nih.gov/factsheets/VitaminB12-HealthProfessional/>
- Owusu, c. (2010). Sick cell Africa- London focus SCA Ghana.
- Peng, Y. Y., & Uprichard, J. (2017). Ferritin and iron studies in anaemia and chronic disease. *Annals of Clinical Biochemistry*, 54(1), 43–48. doi:DOI: 10.1177/0004563216675185
- Piette, J. D., Mendoza-Avelares, M., Milton, E. C., & et al. (2010). Access to mobile communication technology and willingness to participate in automated telemedicine calls among chronically-ill patients in Honduras. *Telemed J E Health*, 16, 1-12.
- Rahman, M. M., Abe, S. K., Rahman, M. S., Kanda, M., Narita, S., Bilano, V., . . . Shibuya, K. (2016). Maternal anemia and risk of adverse birth and health outcomes in low- and middle-income countries: systematic review and meta-analysis. *Am J Clin Nutr*, 495-504.
- Sasaki, K., & Nishii, K. (2010). Measurement of intention to travel: Considering the effect of telecommunications on trips. *Transportation Research Part C*, 18, 36–44.
- Scholl, T. O. (2011, November 1). MATERNAL IRON STATUS: RELATION TO FETAL GROWTH, LENGTH OF GESTATION AND THE NEONATE'S IRON ENDOWMENT. *NutrItion Review*, 69(1), S23–S29. doi:doi:10.1111/j.1753-4887.2011.00429.x.
- Shane, B. (2011). Folate status assessment history: implications for measurement of biomarkers in NHANES. *Am J Clin Nutr*, 94(1), S337-S342.
- Shet, A. S., Rao, A., Jebaraj, P., Mascarenhas, M., Zwarenstein, M., Galanti, M. R., & Atkins, S. (2017). Lay health workers perceptions of an anemia control intervention in Karnataka, India: a qualitative study. *BMC Public Health*, 17, 720.
- Spring, & GHS. (2016). *Ghana: Landscape Analysis of Anemia and Anemia Programming*. Arlington, VA: Spring, .
- Stephenson, L. S., Holland, C. V., & Cooper, E. S. (2000). The public health significance of *Trichuris trichiura*. *Parasitology*, 121((Suppl)), S73–95.
- Stevens, G. A., Finucane, M. M., De-Regil, L. M., Paciorek, C. J., Flaxman, S. R., Branca, F., . . . Ezzati, M. (2013). Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995–2011: a systematic analysis of population-representative data. *Lancet Glob Health*, 1, e16–25.
- Stoltzfus, R., Mullany, L., & Black, R. (2004). Iron deficiency anaemia. In M. Ezzati , A. Lopez, A. Rodgers, & C. Murray, *Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors* (pp. 163–209). Geneva , Switzerland: World Health Organization.

- Tong , A., Sainsbury , P., & Craig , J. (2007). Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*, 19, 349-357.
- UNICEF. (2005). *STRATEGIC COMMUNICATION - FOR BEHAVIOUR AND SOCIAL CHANGE IN SOUTH ASIA*. Kathmandu, Nepal: The United Nations Children's Fund (UNICEF) .
- Weatherall, D. J. (2008). Genetic variation and susceptibility to infection: the red cell and malaria. *Br J Haematol*, 141, 276–86.
- Wei, J., Hollin, I., & Kachnowski, S. (2011). A review of the use of mobile phone text messaging in clinical and healthy behavior interventions. *J Telemed Telecare*, 17, 41-48.
- Weiss, G., & Goodnough, L. T. (2005). Anemia of chronic disease. *N Engl J Med*, 352, 1011–1023.
- White, N. J., Pukrittayakamee, S., Hien, T. T., Faiz, M. A., Mokuolu , O. A., & Dondorp, A. M. (2014). Malaria. *Lancet*, 383, 723–35.
- WHO. (2008). *Worldwide prevalence of anemia 1993–2005*. Geneva, Swizerland: WorldHealth Organization.
- WHO. (2014). *Global targets indicators: what is measured gets done*. Geneva, Switzerland: World Health Organization. Retrieved from http://www.who.int/nutrition/globaltargets_indicators/en/.
- WHO. (2015). *The global prevalence of anaemia in 2011*. Geneva, Swizerland: World Health Organization.
- WHO. (2017). *Word malaria report 2017*. Geneva:: World Health Organization.
- WHO. (2018, november 24). *Worldwide Prevalence of Anemia 1993±2005: WHO Global database on Anemia*. Retrieved from World Health Organization: http://whqlibdoc.who.int/publications/2008/9789241596657_eng.pdf

APPENDICES

Appendix I: Code Book

THEMES	CODE		DESCRIPTION
1. Perceptions of IF Project	PP		The perceptions held by participants/beneficiaries of the IF Project prior to its implementation.
2. Perception of the value of learning	PVL		How is anaemia to their family and work
3. Experiences of participants	EP		Positive or negative experiences encountered by participant during the course of the IF intervention
4. The influence of learning	IL		How the learning/knowledge participants acquired through the implementation of the IF Project influences them or helps them.
5. New knowledge acquired	NKA		New knowledge acquired by participants over the course of the implementation of the IF Project.
6. Desirability (Likes and dislikes) about aspects of IF Project	LDP		The likes and dislikes of beneficiaries relating to certain aspects of the implementation of the IF Project – particular focus on the communications bit.
7. Barriers or Challenges	BC		Barriers and challenges encountered by stakeholders over the course of project implementation. What could cause a participant to miss a call or not flash back
8. Recommendations for enhancing learning experience	RELE		The suggestions and recommendations of beneficiaries relating to needed improvements in the learning experience that was activated over the course of the IF Project implementation.

Appendix II: Participants Information Sheet

STUDY TITLE: KNOWLEDGE, PERCEPTION, AND EXPERIENCE OF PARTICIPANTS IN THE INVISIBLE FISHER’S INTERVENTION IN THE VOLTA AND CENTRAL REGIONS OF GHANA.

INTRODUCTION: I am Boakye Ansah Jochebed Ode, a student at the University Of Ghana School Of Public Health offering a Master’s degree in Public Health. I am conducting a research on the topic “Knowledge, Perception, and Experience of participants in the Invisible Fisher’s Intervention in the Volta and Central regions of Ghana” in partial fulfillment of the award of a Master’s Degree. My contact details are as follows;

Address: P.O. Box KS 9134, Adum- Kumasi

Mobile: 0208774704/0273410736

E-mail: joboakyeansah@gmail.com or joboakyeansah@yahoo.com

Location: University of Ghana Campus

BACKGROUND AND PURPOSE OF RESEARCH: The main aim of this study is to find out the knowledge, perception, and experience of participants in the invisible fisher’s intervention. This study also aims to find out how it has affected the participants, their family, and the community as a whole.

NATURE OF RESEARCH: This is a qualitative study involving the participants of the intervention program, their families, field officers, volunteers and the district fisheries representation.

PARTICIPANTS INVOLVEMENT:

Participants will be required to provide answers to a short questionnaire and partake in either a focus group discussion or an in-depth interview. These will include information about their age, job, and number of times they received the messages and attended the bi-weekly meetings. Participants who cannot read or write will be given the necessary aid where the questions will be interpreted in a local language they understand and their responses written for them. Participants are reassured that their responses will not be used against them and it will be used solely for the purposes of the research.

POTENTIAL RISKS: There may be inconveniences due to the length of the interview. We will try to be as brief as possible.

BENEFITS: There are no direct benefits to you from this study. However, your participation may help us develop better interventions in the area of women in reproductive age.

COSTS: No cost will be incurred in this study since participants will be interviewed at the comfort of their homes or work places.

COMPENSATION: Participants who partake in the study will be given a small gift after the interview is completed as a form of appreciation.

CONFIDENTIALITY: Code numbers will be used for the participants and not their personal names and the data collected will be kept under lock and key and used solely for the purpose of research.

VOLUNTARY PARTICIPATION/WITHDRAWAL: Participation is voluntary and participants have the right to decline to participate and withdraw from the study at any time without penalty and without having to give any reasons.

OUTCOME AND FEEDBACK: The data collected will be analyzed and interpreted for the purpose of the research. After which the data collected will be discarded a few months after the study is entirely completed. The results of the study will be published in journals and peer review platforms to allow everyone the opportunity to know the finding and to be used as existing literature for future research.

FUNDING INFORMATION: The research is funded by the Invisible Fishers pilot study.

SHARING OF PARTICIPANTS INFORMATION/DATA: Participants are reassured that the data collected will not be shared with any individual or organization and will be used solely for research purposes by the Principal Researcher.

PROVISION OF INFORMATION & CONSENT FOR PARTICIPANTS: A copy of the Information sheet and consent form will be given to you after it has been signed or thumb-printed to keep.

For further clarifications or questions, kindly contact the following:

Boakye Ansah Jochebed Ode	Prof. Richmond Aryeetey	Ms.Hannah Frimpong
Prin. Researcher	Supervisor	GHS-ERC Administrator
0208774704/ 0273410736	0261128506	0243235225
joboakyeansah@gmail.com	raryeeyey@ug.edu.gh	Hannah.Frimpong@ghsmail.org

Appendix III: Informed Consent Form

STUDY TITLE: Knowledge, Perception, and Experience of participants in the Invisible Fisher's Intervention in the Volta and Central regions of Ghana.

PARTICIPANTS INFORMATION

I acknowledge that I have read or have had the purpose and contents of the participants' Information Sheet read and satisfactorily explained to me in English ☐ Ewe ☐ Fanti ☐. I fully understand the contents and any potential implications as well as my right to change my mind (thus, withdraw from the study) even after I have signed/thumb printed this form.

I voluntarily agree to be part of this research.

Respondent Name/Initials.....

Signature/thumbprint/Mark..... Date.....

INTERPRETERS' STATEMENT

I interpreted the purpose and content of the participants' Information Sheet to afore named participant to the best of my ability in the Ewe [] or Fanti [] language to the proper understanding of the participant.

All questions, appropriate clarifications sort by the participant and answers were duly interpreted to her satisfaction.

Name of Interpreter

Signature of Interpreter

Date.....

Contact Details

STATEMENT OF WITNESS

I was present when the purpose and contents of the Participants' Information Sheet was read and explained satisfactorily to the participant in the Ewe [] or Fanti [] language.

I confirmed that she was given the opportunity to ask questions/seek clarifications and same were duly answered to her satisfaction before voluntarily agreeing to be part of the research.

Name.....

Signature/thumbprint/Mark.....

Date.....

RESEARCHER STATEMENT AND SIGNATURE

I certify that, the details of this study at large have been thoroughly explained to the participant and all questions and clarifications raised were duly attended to.

Researcher Name.....

Signature.....

Date.....

Appendix IV: Questionnaire

SCHOOL OF PUBLIC HEALTH

UNIVERSITY OF GHANA

“KNOWLEDGE, PERCEPTION, AND EXPERIENCE OF PARTICIPANTS IN THE
INVISIBLE FISHER’S COMMUNICATION INTERVENTION IN THE VOLTA AND
CENTRAL REGION OF GHANA”

SECTION 1: respondent characteristics

1. Ageyears
2. Religion. ☐ Christian ☐ Muslim ☐ African Traditionalist ☐ Other
3. Marital Status. ☐ Married ☐ Single ☐ Divorced ☐ Separated
4. Ethnicity.....

SECTION 2: SOCIOECONOMIC

5. Are you currently employed? [1] Yes [2] No
6. What is your job description?
7. What is your highest level of education? Primary ☐ JHS ☐ SHS ☐ Tertiary ☐ Others ☐

Participation in the project

8. How often have you received messages on your phone?
9. How often have you participated in the group meetings?

Appendix V: Interview Guide for Focus Group Discussion

Perception of IF project and communication intervention

- 1 What do you think the IF project is seeking to achieve for you and your family?
- 2 How important is anaemia, malaria, diet, and other topics you are learning about for:
 - a. You/your family's health?
 - b. Your business as a fish worker?
- 3 What have you learned that you did not know previously about anaemia, malaria, diet, and other topics you are learning about?
 - a. Probe: how has your knowledge changed since the project started?
- 4 How have you used the messages that you are learning about through the phone messages and meetings?
- 5 How has the messages you are leaning about influenced your lifestyle/work?
- 6 What do you like/dislike about receiving messages through the mobile phone?
7. What do you like/dislike about the bi-weekly meetings with the other women in your community?
 - a. Probe, how useful is it for you to receive messages through the phone.
 - b. Probe, how useful is it for you to participate in the group meetings organized by the project.
- 8 What challenges have you experienced in using the mobile phones for listening to the messages?
9. What challenges have you experienced in participating in the group meetings?
10. What can the project do to enhance your experience of using the messages being provided?

Appendix VI: Interview Guide for In-Depth Interview (PFOs)

1. How do you understand the IF project?
2. Which of the strategies, interventions, and tools would you consider key program elements? Please explain.
3. To what extent does the participation of the women in the weekly meetings and listening to the audio messages advance or hinders the IF project?
4. What worked well? Please elaborate.
5. What will you do differently next time? Please explain why.
6. What strategies, interventions, tools, etc., would you recommend be sustained and/or scaled up? Please provide a justification for your response.
7. What strategies, interventions, tools should be discontinued? Why?
8. What were some barriers, if any, that you encountered?
 - A- Staff turnover?
 - B- Lack of key support.
 - C- Lack of technical assistance?
9. How did you overcome the barrier(s)?
10. What effect, if any, do you feel the IF project had on the community?
11. What recommendations do you have for future efforts such as these?

Appendix VII: Interview Guide for In-Depth Interview (VIAMO)

1. What do you know about the IF project?
2. In your experience, what worked well for the implementation of the IVR phone call system?
3. In your experience, what did not work well for the implementation of the IVR phone call system?
4. Which of the strategies for communicating to the women in the IVR phone call system did you consider most useful?
5. What will you do differently regarding implementation of the IVR phone call system? Please explain why.
6. What were barriers/challenges to successful implementation of the IVR phone call system if any, that you encountered?

Probe: understanding of technology? Network connectivity?
7. How did you overcome these barrier(s)?
8. How did the community accept the peer to peer intervention?
9. What are the lessons you have learned from working with Invisible fishers?
10. How can the interventions be expanded to the entire community?

Appendix VIII: Interview Guide for In-Depth Interview (Fisheries)

1. What do you know about the IF project?
2. What lessons from the project did you find useful for yourself/your family?
3. How important was the project to your community? Why?

Probe: in what ways has the project been useful to your family/community?

4. How useful was the IVR phone calling system for communicating with your spouse?
5. What would you like to be changed about how the project was implemented?

Probe: What do you think should be done differently or added to the project?

6. In your opinion, what were the challenges or barriers to successful implementation of the project?
7. Is there anything more you will like to say?

Appendix IX: Interview Guide for In-Depth Interview (Volunteers)

- 1 What did you know about the IF project before you became a volunteer?
- 2 How did you become a volunteer?
- 3 How important is anaemia to the community?
Probe: in what ways has the project been helpful to your family/community?
- 4 What lessons from the project did you find useful for yourself/your family?
- 5 Were any challenges or barriers encountered during the intervention?
- 6 How did you overcome the barriers?
- 7 How did the community accept the bi-weekly meetings?
- 8 How can the intervention be made better?

Appendix X: COREQ Checklist

COREQ (CONsolidated criteria for REporting Qualitative research) Checklist

A checklist of items that should be included in reports of qualitative research. You must report the page number in your manuscript where you consider each of the items listed in this checklist. If you have not included this information, either revise your manuscript accordingly before submitting or note N/A.

Topic	Item No.	Guide Questions/Description	Reported on Page No.
Domain 1: Research team and reflexivity			
<i>Personal characteristics</i>			
Interviewer/facilitator	1	Which author/s conducted the interview or focus group?	
Credentials	2	What were the researcher's credentials? E.g. PhD, MD	
Occupation	3	What was their occupation at the time of the study?	
Gender	4	Was the researcher male or female?	
Experience and training	5	What experience or training did the researcher have?	
<i>Relationship with participants</i>			
Relationship established	6	Was a relationship established prior to study commencement?	
Participant knowledge of the interviewer	7	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	
Interviewer characteristics	8	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	
Domain 2: Study design			
<i>Theoretical framework</i>			
Methodological orientation and Theory	9	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	
<i>Participant selection</i>			
Sampling	10	How were participants selected? e.g. purposive, convenience, consecutive, snowball	
Method of approach	11	How were participants approached? e.g. face-to-face, telephone, mail, email	
Sample size	12	How many participants were in the study?	
Non-participation	13	How many people refused to participate or dropped out? Reasons?	
<i>Setting</i>			
Setting of data collection	14	Where was the data collected? e.g. home, clinic, workplace	
Presence of non-participants	15	Was anyone else present besides the participants and researchers?	
Description of sample	16	What are the important characteristics of the sample? e.g. demographic data, date	
<i>Data collection</i>			
Interview guide	17	Were questions, prompts, guides provided by the authors? Was it pilot tested?	
Repeat interviews	18	Were repeat interviews carried out? If yes, how many?	
Audio/visual recording	19	Did the research use audio or visual recording to collect the data?	
Field notes	20	Were field notes made during and/or after the interview or focus group?	
Duration	21	What was the duration of the interviews or focus group?	
Data saturation	22	Was data saturation discussed?	
Transcripts returned	23	Were transcripts returned to participants for comment and/or	

Topic	Item No.	Guide Questions/Description	Reported on Page No.
		correction?	
Domain 3: analysis and findings			
<i>Data analysis</i>			
Number of data coders	24	How many data coders coded the data?	
Description of the coding tree	25	Did authors provide a description of the coding tree?	
Derivation of themes	26	Were themes identified in advance or derived from the data?	
Software	27	What software, if applicable, was used to manage the data?	
Participant checking	28	Did participants provide feedback on the findings?	
<i>Reporting</i>			
Quotations presented	29	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	
Data and findings consistent	30	Was there consistency between the data presented and the findings?	
Clarity of major themes	31	Were major themes clearly presented in the findings?	
Clarity of minor themes	32	Is there a description of diverse cases or discussion of minor themes?	

Developed from: Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007; Volume 19, Number 6: pp. 349 – 357

Once you have completed this checklist, please save a copy and upload it as part of your submission. **DO NOT** include this checklist as part of the main manuscript document. It must be uploaded as a separate file.

Appendix XI: Ethical Clearance

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted



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Ghana Health Service
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Accra
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1st April, 2019

My Ref. GHS/RDD/ERC/Admin/App/19/100
Your Ref. No.

Jochebed Ode Boakye Ansah
University of Ghana
School of Public Health
Legon

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	GHS-ERC 015/03/19
Project Title	Knowledge, Perception and Experience of Participants in the Invisible Fisher's Communication Intervention in the Volta and Central Region of Ghana
Approval Date	1 st April, 2019
Expiry Date	31 st March, 2020
GHS-ERC Decision	Approved

This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report after completion of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.
- Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra