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PREVALENCE AND DETERMINANTS OF SELF-MEDICATION PRACTICES FOR COVID-19 PREVENTION AMONG PUBLIC TRANSPORT DRIVERS IN LA NKANTANANG MADINA MUNICIPAL DISTRICT

BY

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DECLARATION

I declare, this work is a submission of my effort as a requirement for the completion of the Master's in Public Health. It does not contain any work previously published by another author in whole or part for the award of a degree in the University, except for the work of people which have been duly acknowledged.

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DEDICATION

This work is dedicated to Miss Constance Efua Forson my sister, and Madam Ernestina Araba Mensah, my mother for their support in diverse ways and encouragement throughout my course.

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ABSTRACT

Background: The COVID-19 pandemic is abrupt and has unprecedentedly affected millions of people worldwide. Practices such as proper wearing of face mask, social distancing among other prevention interventions are some recommended mitigating measures. There is an increasing concern about self-medication and consequently, there is a need to respond to self-medicating practice among vulnerable populations such as drivers. The study therefore sought to investigate the prevalence of self-medication practices for COVID-prevention among public transport drivers in La Nkwantanang Madina Municipal District.

Methods: The study was a cross-sectional survey using a multistage sampling technique. The data was collected using a semi-structured and pre-tested questionnaire through a face-to-face interview. Further, data was captured using Kobo-Collect and exported to Stata 16 for analysis. Means, standard deviation, proportions, and frequencies were used to summarize continuous and categorical variables. A Chi-square and logistic regression models were used to determine association between independent and dependent variables. A p-value of <0.05 was considered significant statistically.

Results: The mean age of the respondents was 35.52. Majority, 243 (66.6%) of the drivers had no alternate occupation. Overall, prevalence of self-medication in the past 2 months to prevent COVID-19 was 9.3% (95% CI: 0.02-0.10).

Factors mainly associated with self-medication were a previous experience with COVID-19 symptoms [OR= 6.35(95% CI:3.04 – 13.27); p=<0.001] and presence of a chronic disease [OR=3.32(95% CI: 1.53 – 7.23); p=0.02]. The drugs most commonly used by the drivers to self-medicate were Vitamin C (55%), Ibuprofen (27.5%), Zinc (15%) and

Amoxicillin (12.5%). The most predominating herbal product used to prevent COVID-19 was the leaf of the Neem tree (29%).

Conclusion: The prevalence of self-medication for COVID-19 prevention among public transport drivers in La-Nkwantanang Madina Municipal District was low. Medicines commonly used by public transport drivers were well known by respondents are easily available on the open market at less expensive rates and so respondents can afford them. It is therefore vital to embark on educational campaigns and strict legislative measures in relation to the dispensing of drugs from private pharmacies and chemical shops and facilitate access to health facilities among other important interventions that may cause a behavior change among respondents.

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LIST OF ABBREVIATIONS

AOR	-	Adjusted Odds Ratio
CI	-	Confidence Interval
COR	-	Crude Odds Ratio
COVID-19	-	Corona Virus Disease of 2019
ERC	-	Ethics Review Committee
GHS	-	Ghana Health Service
GPRTU of TUC	-	Ghana Private Road Transport Union of Trade Union Congress
NHIS	-	National Health Insurance Scheme
OR	-	Odds Ratio
PROTOA	-	Progressive Transport Owner's Association
QoL	-	Quality of Life
SARS-CoV2	-	Severe Acute Respiratory Syndrome Corona-virus 2
SDGs	-	Sustainable Development Goals
WHO	-	World Health Organizations

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the study

COVID-19 is a disease caused by the coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease was first confirmed in China in December 2019 and in March 2020 was declared a pandemic by WHO. Ghana reported its first two cases on March 12, 2020, when two infected people arrived in Ghana from Norway and Turkey. The pandemic is abrupt and unprecedentedly affected about 503,131,834 people worldwide (WHO, 2022). Infected people typically exhibit symptoms such as seldom shortness of breath, cough, fever, cough, and profound difficulty in breathing in severe cases (Diterjemahkan dari Huang et al., 2020). No specific treatment is readily available for COVID-19. Fortunately, momentum toward vaccination has been building for months (Bar-Zeev & Inglesby, 2020). Despite these efforts, there are still no treatments for the disease and prevention is key.

Ghana, like other developing countries, had limited resources to manage COVID-19 patients (Bar-Zeev & Inglesby, 2020). Proper wearing of a face mask and social distancing among other prevention interventions are some recommended measures. Further intake of minerals and multivitamins to boost the immune systems in a bid to reduce the risk of being infected is also recommended (Ahmed et al., 2020).

During this time, attention is given to adhering to COVID-19 prevention protocols such as regular hand-washing and social distancing, particularly in public places such as the market and transport avenues. This is because these locations serve as a hub for daily activities

and drivers at transport terminals have an increased risk of infection due to their period of human interactions. Also, public transportation specifically those in Ghana is characterized by heavy vehicular and human activities hence limiting the effective practice of social distancing and making illusory of all COVID-19 prevention protocols. For example, while onboard, passengers sit very close to each other, creating a fertile environment for spread and transmission (Bonful et al., 2020)

The increased levels of panic, fear, anxiety, and misinformation associated with COVID-19 disease have promoted buying, hoarding, and use of medicines making people prone to self-medication (Kohler & Mackey, 2020). The WHO defines self-medication as the practice of using medicines by patients or individuals to treat diseases on their initiative without seeking advice from a healthcare provider (Araia et al., 2019). Self-medication is an important first aid to illness in many parts of Africa (Kong et al., 2021), and owing to the limited access to healthcare services and the unavailability of approved treatment for COVID-19, the practice has gained interest in countries such as Ghana. Primarily, self-medication comprises the use of over-the-counter drugs without an appropriate prescription, inconsistent use of leftover drugs from a previous prescription as well as the use of traditional and herbal medicines (Tesfamariam et al., 2019).

Before the pandemic, self-medication was in vogue globally with prevalence ranging from 32.5-to 81.5% (Kassie et al., 2018). In Africa, studies conducted in Ethiopia and Ghana reported rates between Ethiopia (43.2%) (Sisay et al., 2018), and Ghana (70%) (Donkor et al., 2012). The situation of unavailability of effective treatment and vaccine or antiviral therapy against and overwhelmed and strained healthcare facilities (Bright et al., 2021), increases the risk of self-treatment practices for COVID-19 prevention particularly among

low resource settings such as India, Bangladesh, and other developing countries in African (Kong et al., 2021)

In Ghana, the burden of self-medication primarily focused on the use of antibiotics. The outbreak of COVID-19 has led to increased demand for antibiotics, hydroxychloroquine, and multivitamins as immune boosters resulting in shortages with increases in drug cost, particularly for antimalarials (Sefah et al., 2021).

For drivers or transport service providers, the circumstances and the environment in which they work constantly expose them to the infection. Although this population may be knowledgeable about the dangers posed by these medications, the fear of being infected seemed paramount. This cross-sectional study, therefore, aims to particularly determine the prevalence and determining factors of self-medication among drivers in an epicenter of COVID-19 in Accra, Ghana. The study will further describe the commonly used drugs to self-medicate during the COVID-19 pandemic. Findings from this study will inform healthcare policy on measures to put in place to improve the well-being of the vulnerable population and mitigate the spread of the disease.

1.2 Problem statement

Public transport is an essential service that requires continuity even during the COVID-19 pandemic. This inevitable arrangement predisposes passengers and transport drivers to increased risk of infection due to the collective nature of mobility in such a confined and crowded space. The need to protect oneself becomes imperative. Further, the perceived risk and associated anxiety thus tend to promote self-medication (Chopra et al., 2021). Although recommended preventive measures such as hand-washing and wearing of face masks could be widely used, experiencing COVID-19 symptoms could compel them to

self-medicate particularly in an era where acceptance of clinical measures such as intake of vaccine is faced with hesitancy (Acheampong et al., 2021).

Self-medication is influenced by factors such as a past experience with self-medication, lack of medical insurance, level of education, occupation, low income, lack of time to visit physicians, and limited knowledge. (Sadio et al., 2021; Wegbom et al., 2021; Quispe-Cañari et al., 2021). Additional studies have attributed drivers of self-medication to associated anxiety and nature of disease occurrence, thus infection rate and case-fatality (Chopra et al., 2021).

Self-medication can cause tremendous, adverse drug reactions and side effects. (Malik et al., 2020) Further, the risk of the wrong route of administration, wrong dosage, prolonged use than recommended, risk of addiction/dependency, and pathogenic resistance are other concerns of self-medication. Compounding the burden of self-medication is the effect it will have on existing COVID-19 mitigating strategies which can reverse recent achievements (Malik et al., 2020). A gradual increase in drug resistance is one of the dire consequences of self-medication. Although this phenomenon is expected over time, the recent upsurge in self-medication has escalated consequences. This has a life-threatening effect, prolonged admission, and increased cost of healthcare.

In spite of the negative effects of self-medication such as multi-drug resistance, high cost of care, and increased morbidity and mortality, studies on its prevalence and determining factors particularly among drivers are unknown. The practice of self-medication has become critical within healthcare management and the upsurge is an entrenched global health challenge, especially during the covid-19 pandemic (Onchonga, 2020). Thus, there

is a need to manage appropriate self-medication practices by enforcing policies and involving healthcare professionals as well as policymakers. This study, therefore, seeks to assess self-medication practices and associated factors among public transport drivers.

1.3 Research questions

1.3.1 The questions below were a guide to the study;

1. What is the proportion of public transport drivers who have self-medicated during the past 2 months for COVID-19 prevention?
2. What are the factors that influence self-medication for COVID-19 prevention?
3. What drugs are commonly used to self-medicate for COVID-19 prevention?
4. What herbal foods/ products are often used as a prevention for Covid-19?

1.4 General and Specific objectives

1.4.1 General objectives

To determine the prevalence of self-medication practices for prevention of COVID-19 among public transport drivers in La-Nkwantanang Madina Municipal District.

1.4.2 Specific objectives

1. To estimate the proportion of La-Nkwantanang Madina public transport drivers who have self-medicated in the last 2 months to prevent COVID-19.
2. To determine the factors which influence the practice of self-medication among La-Nkwantanang Madina public transport drivers for COVID-19 prevention.
3. To describe the drugs commonly used by La-Nkwantanang Madina public transport drivers to self-medicate for COVID-19 prevention.
4. To assess the use of herbal foods/products by La-Nkwantanang Madina public transport drivers to prevent Covid-19 infection.

1.5 Justification

Antibiotics are one of the commonly prescribed medications worldwide hence resistance to it is of great public health relevance (Donkor et al., 2012)-. Consequently, self-medication has been identified as a major contributor to antimicrobial resistance in low- and middle-income countries. Public transport drivers due to their busy work schedules resort to self-medication to save time thus, controlling self-medication, especially among drivers will help reduce the prevalence of antimicrobial resistance. Results from this current study will provide evidence on the burden and associated factors of self-medication. This will further aid in providing evidenced-based-intervention in controlling self-medication among public transport drivers in developing countries.

1.6 Conceptual framework

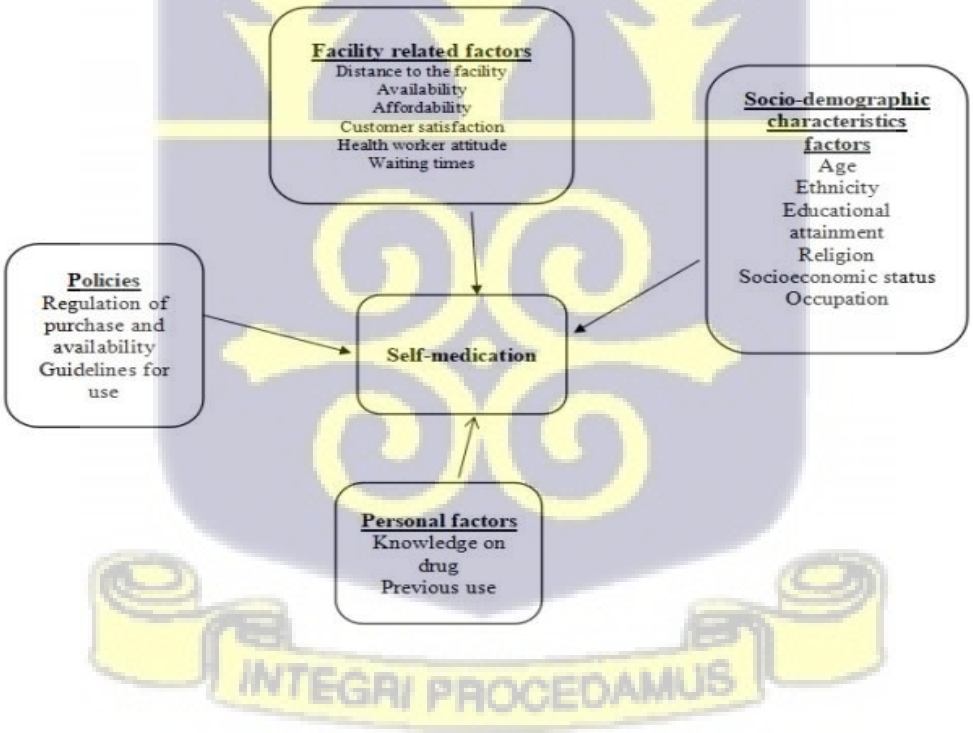

Figure 1: Conceptual framework on association factors of self-medication during the COVID-19 pandemic (Adopted from the HUM by Andersen & Newman, 2005)

The conceptual framework includes both dependent and independent variables. Self-medication is the dependent variable among public transport drivers.

1.6.1: Description of Conceptual Framework

Choice of self-medicating is widely dependent on both direct and indirect demographic factors, healthcare-related factors, availability and accessibility of drugs, previous drug usage, and knowledge of the drug. With regards to demographic information, for example, people with high educational attainment present a better chance to self-medicate as compared to those without any formal education, possibly due to awareness of benefits and exposure. Further, individuals who are employed are more likely to afford medications. Similarly, they are more likely to purchase drugs because they would not want to lose working hours and spend all their time in the hospital. Those who are old are more conscious of their health and would rather prefer approval from health professionals before using any medication. However, exposure to the use of previous drugs may compel older people to self-medicate.

The relatively high cost, long waiting time and staff attitude associated with healthcare services influence the individual choice to self-medicate. Accessibility to health facilities could also play a major role in self-medication. The farther the distance, the less likely they are to patronize it, and the more likely they are to buy medication themselves from a nearby drug store as they see it to be more convenient and easily accessible. Another major factor could be the unavailability of drugs at health facilities which could be found at pharmacy shops and can easily be purchased over the counter. The unsustainability of the health insurance-substandard drugs that might not respond effectively to treatment could also influence self-medication. Lack of policies and the availability and purchase of certain

medications as over-the-counter drugs could be a failure of the government side which could influence self-medication. If policies are unforced, the availability and accessibility of certain drugs will change and consequently, the behavior of individuals getting them without a prescriber's consent will be minimized.

1

[1] Health facility and policy related factors were not examined in the study.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature on self-medication practices during the COVID-19 pandemic among high-risk populations, specifically public transport drivers. The review is thematically arranged under the following headings: COVID-19 and well-being, Global situation of self-medication during the COVID-19 pandemic, commonly used drugs for self-medication, and factors influencing self-medication. Self-medication can be defined as the self-consuming of medicine without consulting a medical doctor or health professional for either diagnosis or treatment. (Halboup et al).

2.2 COVID-19 and well-being

Quality of life which is the subjective feeling by patients of the multifaceted effect of the disease recently has gained attention with concerns of social progress and the transformation of medical care and service systems. With regards to the importance of achieving the Sustainable Development Goals (SDGs) specifically, goal three which seeks to ensure the well-being and healthy life of all (UN, 2018), it is necessary to characterize the impact of COVID-19 on the health-related quality of life of infected people. To date, there are enough studies that have been conducted investigate how severe the impact of the COVID-19 pandemic is on quality of life and mental health. Several multidimensional health status classifications are widely available and used to measure health-related quality of life. A study conducted in China found poor QoL among COVID-19 patients at the 1-month follow-up as compared to the normal population (Chen et al., 2020).

2.3 Global situation of self-medication during COVID-19 pandemic

The guidelines by the WHO advised that individuals should know appropriately know medication use, efficacy as well as adverse effects. The COVID-19 pandemic has created deep-seated anxiety and fear of the unknown as a result of stigma, lack of information, and cultural issues preventing people from seeking professional help. (Owings, 2020). Typically, most Africans use self-medication and religious means to manage and treat diseases (James et al., 2018). The practice should be stingingly monitored particularly in developing countries that are facing economic crises and often faced with economic crises and have low educational standards as well as inadequate healthcare facilities during the COVID-19 pandemic. Indeed, the use of self-medicated drugs during the covid-19 has been reported globally with major concern. Further, (WHO, 2010) does not recommend self-medication with any medicines, as a form of management or prevention of COVID-19. Despite the warnings and the widely known effects of self-medication, countries of sub-Saharan Africa have been placed on the spot of light of self-medication. A cross-sectional study conducted in Togo found the prevalence of self-medication to be 34.2% (Sadio et al., 2021). This is much low than the prevalence reported in a cross-sectional study conducted in Dhaka. In that study, the prevalence of self-medication stands at 88.33%. In another cross-sectional study conducted in Nigeria, the overall prevalence of self-medication for the prevention and treatment of COVID-19 was 41% (Wegbom et al., 2021). The disparity in the observed prevalence could be attributed to (1) social media influence that promotes various products to treat or prevent COVID-19 (2) the influence of leaders who have claim to have verified the efficacy of some products (3) delay in finding an appropriate treatment

for COVID-19 based on randomized trial and (4) the stigmatization, which encourages some people to take care of themselves at home.

2.4 Commonly used drugs to self-medicate during the COVID-19 pandemic.

Across various cultures of the world, many different drugs are self-medicated. Some of these drugs are commonly self-medicated worldwide. Analgesics (64.6%) followed by antipyretics (40.7%) and then antibiotics (25.4%) for example are some of the most commonly self-medicated drugs (Araia et.al, 2019). This finding differs from a study conducted by Kumar et.al in 2013 which showed antipyretics (74.8%) as the most used drug for self-medication by a majority of the participants followed by analgesics (65.8%) and antibiotics (39.3%). Ghana recently has become an epicenter for COVID-19 in Africa. Coupled with an upsurge in cases, multiple publications provide options for the treatment and control of COVID-19. This phenomenon has been prevalent. In Peru, the Ministry of Health has recommended the treatment of symptomatic COVID-19 with specific medications such as hydroxychloroquine, azithromycin and ivermectin in the clinical setting to control the pandemic. (Chemie-Quintero et al., 2021). Another cross-sectional study conducted in Peru found that most of the respondents self-medicated with paracetamol for respiratory disorders specifically the flu or cold. It was observed that all the surveyed drugs (paracetamol, azithromycin, ibuprofen, amoxicillin, hydroxychloroquine and antiretrovirals, and hydroxychloroquine) were consumed for various symptoms. (Quispe-Cañari, 2020). In the city of Dhaka, there has not been any precise effective treatment for COVID-19, however, it has been observed that prescription-only drugs such as ivermectin, montelukast, hydroxychloroquine, doxycycline azithromycin, vitamin D, are reported to experience a shortage in dispensaries and supply

centers throughout the country, indicative of use to treat COVID-19 (Rakedzon, 2021). In a cross-sectional study conducted in Togo, the most common medications were vitamin C (27.6%) and traditional medicine (10.2%). Only a few participants reported using chloroquine/hydroxychloroquine (Sadio et al., 2021). Similarly, in another study conducted in Nigeria, commonly used drugs for self-medication were vitamin C and multivitamin (51.8%) and anti-malarial (24.9%) during the COVID-19 pandemic (Wegbom et al., 2021). A cross-sectional study done in the Upper West Region of Ghana among pregnant women showed that Ibuprofen, tramadol, coartem, amoxicillin, worm expel and diclofenac were the most significantly used drugs. (Sina, 2017)

2.5 Factors associated with self-medication

The factors associated with self-medication can be classified broadly into 4 main sections. These sections are Personal factors, Socio-demographic factors, Facility related factors, and Policy related factors.

2.5.1 Socio-demographic Factors

Socio-demographic factors include occupation, age, religion, gender, and educational background. Knowledge about medication can influence one's decision to either self-medicate or seek professional care, this may be especially evident if one is in the health profession such as being a doctor, nurse, pharmacist, or lab technician. Early works have studied the association between self-medication and socio-demographic factors. Kassie et.al (2018), Quispe-Canari (2021), and Sadio et al (2021) incorporated factors such as higher education, being female, age, and working in the health sector in their assessment of the prevalence of self-medication. Reporting a specific case, Wegbom et al (2021), conducted a study in Nigeria and revealed that, self-medication was particularly prevalent

among respondents aged below 24 years. These study findings differ from a study conducted by Barbara et. Al (2016) in DR. Congo and Adama (2020) in Wa Municipal District among pregnant women which revealed no significant association between age and self-medication practices as most (75.5%) of respondents in Wa who practiced self-medication were aged between 25-34 years, also women who were married (92.6%) self-medicated more as compared to unmarried women.

Self-Employment

Some studies have been conducted to assess the prevalence of self-medication among self-employed people. Self-employed are usually independent and are accustomed to making their own decisions in all aspects of their lives including the part that involves their health. (Figueiras et al., 1999). The independence coupled with the fact that self-employed people may not be willing to leave their businesses unattended, especially in instances where the disease is not considered to be serious could contribute to the increase in the prevalence of self-medication among this group. Self-employed respondents had higher chances of self-medicating as compared to their counterparts (Agyei-Boateng, 2015). This is backed by the findings of Adama (2020) among pregnant women where 126 (75.4%) of the respondents had the highest prevalence of self-medication.

Education

Low educational level, as well as poor recall of dosage instructions given by the physician, could lead to poor knowledge of diseases and drug use (Aishwaryalakshmi et al., 2012). This may lead to patients taking medications at dosages familiar to them or as recommended by a trusted relation. A study in Ethiopia revealed a significant association between educational background and self-medication where there was an increase in self-

medication practices among participants whose parents had a low educational background. (Befekadu et al., 2014). This is in agreement with studies conducted by Aziz et al., (2015) in a community-based study where the mean score (62.2) of health literacy among respondents who self-medicated was considerably low as compared to their counterparts (69.1) who did not self-medicate. On the other hand, different studies seemed to present a different opinion. Some study results show that self-medication is quite prevalent in people with higher educational background due to their accessibility to information about diseases and drugs as shown by Mahmoud et al (2021) who conducted a study among tertiary medical and pharmaceutical students and out of 170 respondents, 97 (57.1%) were seen to self-medicate.

2.5.2 Personal Factors

Personal factors include knowledge about drugs as well as previous use of the drug. In Nigeria, having sufficient knowledge (OR: 0.64; 95% CI: 0.19–0.77) was associated with self-medication (Wegbom et al., 2021). Some people do not see the need to visit the hospital when they fall sick because they think they know enough about their health condition and can therefore manage it when they encounter it. (Van den Boom et al. 2008).

Perception & Previous Use of Drug

Some people tend to self-medicate because they perceive some illnesses as minor (Van den Boom et al. 2008). Thus, when people think they are fully abreast with certain health conditions and how to manage them, they do not see the need to seek professional care. This can be coupled with if the person has had an unsatisfying experience at the hospital or has used some particular drugs for a similar condition, as in a study by Kassie et.al, which showed previous use of drugs (AOR=1.78,95% CI: 1.22.2.61) was associated with

self-medication. These reasons together, maximize the chances of practicing self-medication.

2.5.3 Health facility related Factors

Access to health facilities may be influenced by either financial constraints or geographical factors. Affordability of healthcare services, distance to the health facility, and waiting time are some of the facilities related factors that may influence self-medication. Self-medication in Sub-Saharan Africa is high due to the limited health care systems and facilities and poverty. (Arikpo et al., 2010).

Geographical access to Health facilities

Self-medication is a health-seeking behavior that is considered to be a possible health threat to people who practice it. Nevertheless, in areas where the health facility is far away, self-medication is sometimes encouraged to treat certain ailments considered to be non-severe. (Yussuf & Omarusehe, 2011). This, however, can be considered appropriate if the people are adequately informed about their health conditions. (Yussuf & Omarusehe,2011). This finding is in synch with a study by Kassie et.al. (2018) reported that accessibility of health facilities was nearly 4 times (AOR=3.71, 95% CI= 1.31, 10.51) likely to increase the practice of self-medication. Also, respondents who had to travel for more than an hour (n=622, 86.2%) to reach health facilities self-medicated more as compared to those who traveled for less than an hour (n=100, 13.9%). (Mbarambara et.al, 2016).

A compiled study in 2004 by Van den Boom et al., indicated that access to healthcare facilities is still a problem as healthcare facilities were not evenly distributed across the country of Ghana. Projects to increase accessibility are however underway: On Tuesday,

August 17, the President of the Republic of Ghana (President Nana Akuffo Addo) launched the agenda 111 projects. The project is to establish 101 District hospitals, 6 Regional hospitals in the newly created regions as well as a regional hospital in the Western region, a renovated Accra Psychiatric hospital, and 2 other psychiatric hospitals in Kumasi and Tamale. This Agenda 111 project is to ensure that, Ghanaians have easy financial and infrastructural access to quality healthcare with the National Health Insurance Scheme. (Joyfm online, 2021).

Financial access to health facilities

According to Salisu and Prince (2009), it is best known for Ghanaians to attempt to treat themselves when sick before going to the healthcare facility to seek professional care. This practice among the majority of Ghanaians is to likely reduce the cost of transportation to and from the healthcare facility, especially among people who live in rural areas and do not have the healthcare facility in close range, and also make the cost of consultation more affordable. This is evident from the results of a study conducted by Kassie et al., (2018) among household members in Northern Ethiopia which revealed that the inability to afford health care fees was a major reason for self-medicating amongst 33(12.74%) of the participants of the study. Further, Aziz et al., also revealed from their study that one most common reason for self-medicating was the high cost of physician visits with a prevalence score of 25.6% and also, Oluwole et al. (2016) found that, 10.8% of respondents used self-medication as a reason to self-medicate.

Patient Dissatisfaction

Patients' dissatisfaction concerning the services received at the public health care facility and from the health care personnel including long waiting hours to see a doctor are among

the main factors contributing to the increased prevalence of self-medication practices. (Yussuf & Omarusehe,2011). This is to say, patients are scared away from seeking professional health care when they anticipate the services, they will receive at the health care facility.

2.5.4 Policy related factors

Guidelines for use

The actions and in-actions of government including the health policies and health structures shown in various countries influence the health-seeking attitudes among people in different parts of the world. Investigating self-medication in Ghana, a study by Van den Boom et al., (2008) revealed that health policies of the government of Ghana attached more importance to curative health care as compared to preventive health care in rural areas. The WHO revealed that 50% or more of all countries failed implement basic policies that will help enhance better health-seeking behaviors among its citizen (WHO, 2010). It disclosed that clients engaged in poor health-seeking behaviors because about 70% of clients in the private sector and 60% in the public sector do not seek health treatment according to laid down policies and protocols. (WHO, 2010). Studies from the United Kingdom show that the government views self-medication as a way of sharing the cost of healthcare with consumers to reduce the burden on the health insurance scheme. (Bradley & Blenkinsopp, 2010).

Regulation of purchase and availability

In the early 1900s, the government of Vietnam formulated policies to promote the development of the healthcare sector. These policies led to an increase in the number of

private pharmaceutical companies making drugs easily available to consumers. (Togoobaatar et.al., 2010).

Kassie et al., (2018) indicated that people are likely to practice self-medication for reasons such as the availability of drugs in places other than pharmacies and excessive advertisement of drugs. The increase in the advertisement and sale of drugs at lorry stations promotes self-medication. Medicines meant to be sold as prescriptions only including antibiotics are sold without a prescription by peddlers, market booths, and drug stores. (Biduki, 2013).

Self-care could involve the use of left-over prescriptions from a previous illness or self-made herbal preparations. There are non-formal health care providers in Ghana and this group sometimes includes Chemical sellers because even though chemical shops are supposed to be manned by trained and qualified persons, some of the shops are attended to by untrained persons. (Nonvignon et al., 2010) A study conducted by Biduki in 2013 on the effects of advertisements on self-medication practices revealed that 97% of respondents relied on advertisements in either electronic or printed form for information on self-medication. About 35% rely on television advertisements while 58% rely on radio advertisements and the remaining 87% rely on billboard advertisements and other sources of information.

The danger of an increase in the incidence of self-medication in developing countries is poor distribution, regulation, and sale of prescription drugs. This lack of control is cited as one of the reasons for self-medication. (Togoobaatar et al., 2010)

CHAPTER THREE

3.0 METHODS

3.1 Study design

The study was an analytic cross-sectional survey using quantitative data collection methods. This design was suitable for this study as it allows the collection of both outcome and exposure variables at a time.

3.2 Study site description

The study was conducted in four (4) major transport stations in the La Nkwantanang Madina Municipal district. The municipality located in the Greater Accra Region, is one of the 16 Metropolitan, Municipal, and District Assemblies in the region. It was created in 2012 as part of the newly created Assemblies aimed at strengthening decentralization and bringing development to the doorstep of citizens. According to the 2010 population and housing census, the municipality has a total population of about 111,926 representing 2.8% of the region's total population. Females' constituent majority (51.5%). It is bordered on the East by the Adentan Municipal, West by the Ga East Municipal, on the South by Accra Metropolitan Area, and on the North by the Akwapim South District (see figure 1.1). La Nkwantanang Madina Municipality is generally urban (84%). Further, these four major stations serve as a major transportation hub for goods and services to all parts of the country. The stations primarily provide the transport of goods and services and are regulated by the Ghana Private Road and Transport Union (GPRTU) and the Progressive Transport Owners Union (PROTOA). The municipal serves as a business hub in Accra offering services such as selling goods/products and transport system. the district is made

up of about twelve (12) different stations serving as transport terminals to some other parts of the country. These terminals are cooperated owned and managed by appointed leaders.

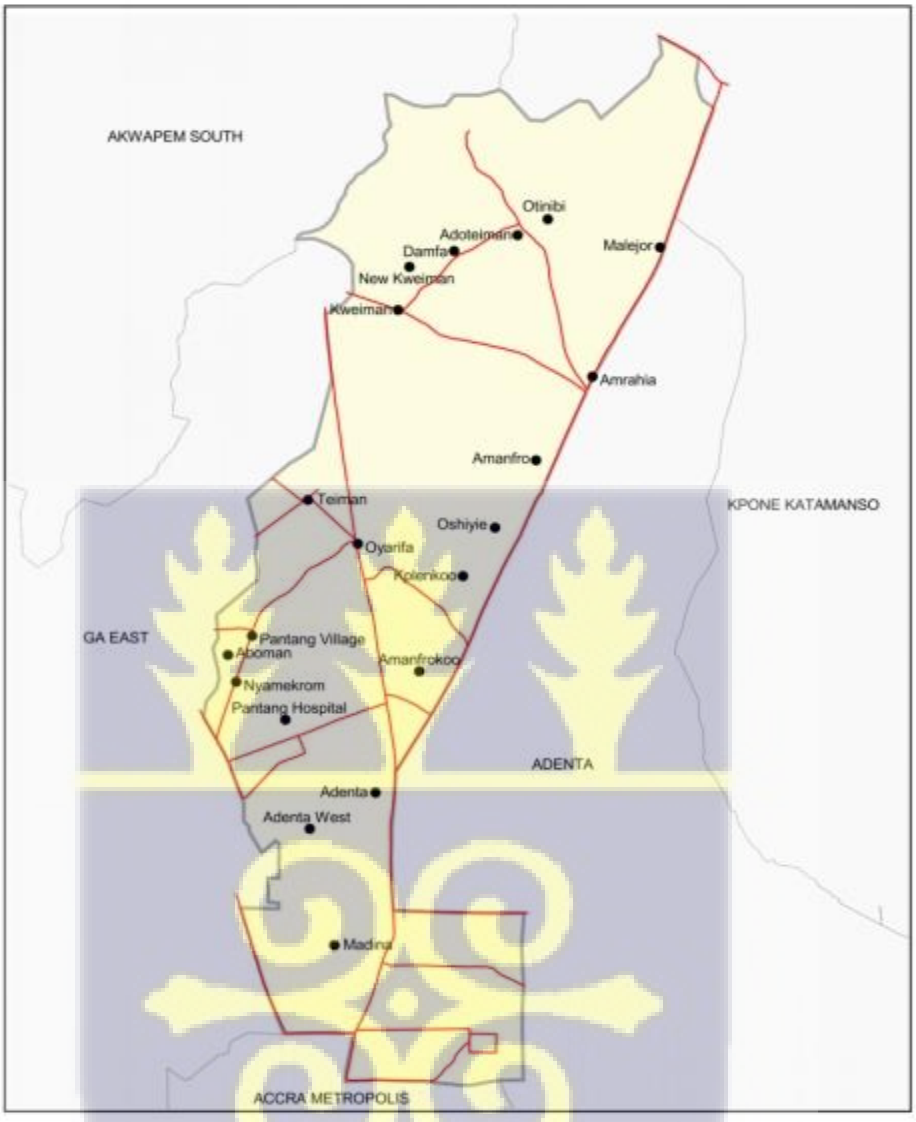

Figure 2. Map of La-Nkwantanang Madina Municipality

3.3 Study population

The study comprised registered public transport drivers from selected stations in the La Nkwantanang Madina Municipal district. A public transport driver in this study was defined as an individual who drives a vehicle for a living.

3.4 Inclusion and exclusion criteria

3.4.1 Inclusion criteria

The study included:

All public transport drivers who were registered members of the Amot Drivers Transport union, GPRTU, and PROTOA at the La Nkwantanang Madina Municipal district.

3.4.2 Exclusion criteria

The study excluded:

Divers who were critically ill at the time of the study and required medical attention were also excluded.

3.5 Sample size

The required sample size was calculated using a formula: $N = Z^2pq/e^2$ by Cochran

Assumptions were based on:

5. the reliability coefficient (z) of 1.96 at a 95% confidence level,
6. margin of error (e) of 5 %,
7. the proportion (p) of 34.2% is based on a study in Togo (Sadio et al., 2021)
8. q=(1-p=0.398).

The sample size that was obtained was increased by a non-response rate of 5%

$N = Z^2pq/d^2$

$$\frac{(1.96)^2 \times (0.342 \times 0.658)}{(0.05)^2} = \frac{0.8644}{0.0025} = 345.79 = 346$$

Non-response rate of 5% (0.05) gives: 0.05 x 346 = 17.3=18

Adding 18 to the sample size (n) of 346 gives, ***(i.e. 18+ 346= 364)***

Hence, the sample size desired for this study is 364**.**

3.6 Study variables

3.6.1 Outcome variable

The dependent variable in this study was self-medication. Self-medication was measured by the intake/use of medicines/drugs, herbal preparation, or any product to prevent COVID-19 without any prescription from a physician in the past two (2) months (Tesfamariam et al, 2019).

3.6.2 Independent variables

Independent variables in this study were categorized into socio-demographic characteristics and social environment. The socio-demographic characteristics were measured variables such as age, ethnic group, marital status, NHIS status, educational level, income level, gender, and religious affiliation. The social environment measured the availability of social support.

Table 1. Dependent and Independent variables in the study

Variable	Operational definition	Scale of measurement	Type of variable
Self-medication	intake/use of medicines/drugs, herbal preparation, or any product to treat or prevent COVID-19 without any prescription from a physician in the past two (2) months	Categorical	Dependent variable
Gender	Defined as male and female	Categorical	Nominal
Age	Age at last birthday	Numeric/ Continuous	Ratio
Level of education	Define as no education, primary, secondary, and tertiary	Categorical	Ordinal
Marital status	This is defined as single, married, divorced/separated, and widowed	Nominal	Nominal
Religion	Define as Christianity, Islam, and traditionalist	Nominal	Nominal
NHIS status	Being a member of the National Health Insurance Scheme	Nominal	Nominal
Ethnicity	Define as the tribe belonged to	Nominal	Nominal

3.7 Sampling method

3.7.1 Selection of transport stations

Purposive sampling was used to select four (4) major stations in the La Nkwantanang Madina Municipal district- Amot Owners Transport Union, Top Transport Union, Abokobi branch of GPRTU of TUC, and Madina-Adenta branch of PROTOA. These stations were purposively selected because they constitute a larger proportion of public transport drivers in the municipality. Further, they serve as major stations that provide transport services.

3.7.2 Selection of transport drivers

Proportionate sampling was used to determine the number of public transport drivers required/to be interviewed at each station to achieve the required sample size. A simple random sampling technique was then to be used to select public transport drivers for a face-to-face interview.

3.8 Quality control

3.8.1 Training of Research Assistants

For data quality assurance, two (2) research assistants were trained by the principal investigator for a week before actual data collection on data collection tools. The study aim and study rationale were communicated to research assistants. Further, they were trained on how to ask questions through a face-to-face interview to gather expected data. During training, the same interpretation of questions was established for all questions.

3.8.2 Pretesting

Also, the data collection tool was validated through pre-testing. This pre-testing was done at the Dodowa transport station. After pre-testing, the data collection tool was modified and finalized after debriefing from pretesting. The questionnaire was administered in

English; however, questions were translated into the local language or any language where appropriate, thus for participants who do not understand or speak the English language.

3.9 Data collection tool

Quantitative data were collected from study participants. A semi-structured questionnaire was used to collect data. The questionnaire had three (3) main sections. The first section comprised socio-demographic characteristics (such as age, level of education, religion, marital status, gender, ethnicity) of drivers, Section two (2) comprised the prevalence of self-medication and commonly used self-medicated drugs (ibuprofen, amoxicillin, azithromycin, hydroxychloroquine, vitamin C, Zinc and any other drug (was an open question) and Section three (3) investigated the factors that influenced the practice of self-medication. The self-medication category assessed the various drugs used to self-medicate, sources of information on self-medication, and reasons for self-medication.

3.10 Data collection procedure

Data was collected using a semi-structured questionnaire from 3rd January 2022 to 17th January 2022. At the station, research assistants visited the various selected stations and randomly selected public transport drivers for face-to-face interviews. Public transport drivers were randomly selected based on their free time and availability to answer questions a few minutes before loading their vehicles. Before the interview, the study procedure was explained to the respondent, and consent was obtained from eligible public transport drivers. They were required to sign two consent forms; one was kept by the participant and the other by the research team. Once consent was sought from eligible public transport drivers, he/she excused himself/herself with the research assistant and proceeded to answer

questions asked by the research assistant. At the end of the questionnaire, the public transport drivers were thanked and dismissed.

3.11 Ethical issues

Ethical approval for the study was sought from the Ghana Health Service (GHS) Ethics Review Committee (ERC). Permission was sought from the administration of the La-Nkwantanang Madina Municipal District and the GPRTU of TUC and PROTOA at the Madina local branch before data collection. Also, written consent was sought from all eligible drivers after explaining the aims and objectives of the study, benefits and risks, and procedures involved in participation. Eligible participants were made to understand that, their participation in the study is purely voluntary and they can opt-out at any time. However, withdrawal from the study will not affect their work. They were also educated to understand that there will be no compensation for being part of the study. Data that will be collected will be kept under lock and key, with only the principal investigator and supervisor having access. To ensure anonymity, respondents were only identified with codes and numbers instead of their names during and after data collection. Due to the ongoing pandemic and the risk of direct contact during interviews, participants and investigators were mandated to put on a face mask and maintained some distance between them, also sanitizers were used by investigators and participants before and after any physical contact is made.

3.12 Data analysis

Data was collected using Kobo Collect Toolbox, a free open-source tool for mobile data collection, and extracted to Microsoft Excel 2016. Further, data was cleaned and checked

for response appropriateness and multiple imputation techniques were used to handle missing data.

Data were further exported to Stata version 16/MP (College Station, Texas 77845) for analysis. Descriptive statistics such as means, standard deviations, frequencies, and proportions were used to summarize both categorical and continuous variables. Further, frequencies and proportions were used to describe the proportion of drivers' self-medicating and drugs commonly used to self-medicate. The Chi-square test was used to determine the relationship between dependent and independent variables. To determine factors associated with self-medication, uni-variable and multi-variable logistic regression analyses were used to determine the strength and direction of associations. A p-value of <0.05 was considered statistically significant.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics of public transport drivers in the La Nkwantanang Madina Municipal district.

Table 4.1 summarized the socio-demographic characteristics of public transport drivers. Overall, 365 public transport drivers participated in the study and all were males. The mean age was 35.52 ± 10.46 and 131 (35.9%) were aged between 18 and 29 years. About half of 204 (55.9%) were single at the time of the study. Most 243 (66.6%) of the drivers had no alternate occupation. Only 1.4% and 32% had alternate formal and informal occupations respectively. Less than half 164 (44.9%) had attained the JHS level of education. Most 233 (63.8%) of the drivers were Christians by religion and Akans 152 (41.6%) by the tribe. About 6.9% had the chronic disease at the time of the study and less than half 169 (46.3%) were insured under the national health insurance scheme.

Table 4.1 Socio-demographic characteristics of public transport drivers in La Nkwantanang Madina Municipal district

Variable	**Frequency N= [365]**	**Percentage [%]**
Age group (years)		
18-29	131	35.9
30-39	128	35.1
40-49	58	15.9
50-59	38	10.4

40+	10	2.7
Mean (±SD)	**35.52 ± 10.46**	
Sex		
Male	365	100
Female	0	0
Marital status		
Single	204	55.9
Currently married	147	40.3
Divorced/separated/widowed	14	3.8
Alternate occupation		
Formal employment	5	1.4
Informal employment	117	32.0
No alternate employment	243	66.6
Educational level		
No formal education	23	6.3
Primary	62	17.0
JHS	164	44.9
SHS	97	26.6
Tertiary	19	5.2
Religion		
No religion	43	11.8
Christian	233	63.8

Islam	85	23.3
Traditional	4	1.1
Ethnicity		
Ewe	104	28.5
Akan	152	41.6
Ga	60	16.4
Northern tribe	49	13.5
Have any chronic disease		
Yes	25	6.9
No	283	77.5
Don't know	57	15.6
Active on NHIS		
Insured	169	46.3
Not-insured	196	53.7
Note: **NHIS-National health insurance scheme**		

4.2 COVID-19 related practices among public transport drivers

With regards to the practice of COVID-19 prevention methods, the public transport drivers were asked about adherence to safety protocols on COVID-19. Most 160 (43.8%) of the public transport drivers responded not being afraid of COVID-19. An estimated 33.7% and 22.5% were slightly afraid and very afraid of COVID-19 respectively. About quarter 105 (28.8%) of the public transport drivers are currently practicing COVID-19 safety protocols. The rest did not 54 (14.8%) or sometimes 206 (56.4%) practice COVID-19 safety protocols. Also, 20% of the public transport drivers had ever experienced COVID-19

symptoms of which headache 14 (18.7%) and cough 11 (14.7%) were predominating symptoms.

Table 4.2 COVID-19 related practices among public transport drivers in La-Nkwantanang Madina Municipal district

COVID-19 related practice	n (%)	%
How much are you afraid of COVID-19?		
Not afraid	160	43.8
Slightly afraid	123	33.7
Very afraid	82	22.5
Currently practicing COVID-19 safety protocols		
Yes	105	28.8
No	54	14.8
Sometimes	206	56.4
Ever experience COVID-19 symptoms		
No	291	79.7
Yes	74	20.3
Most experienced COVID-19 symptoms		
Body pain	2	2.7
Chest pain	1	1.3
Cough	11	14.7
Dizziness	1	1.3
Fatigue	1	1.3
Fever	4	5.3

Headache	14	18.7
Loss of taste	3	4.0
Nausea	1	1.3
Sneezing	1	1.3
Sore throat	1	1.3
Stomach ache	6	8.0
Tiredness	5	8.0
Comorbid symptoms	24	32.0
Use of herbal medication before experiencing COVID-19 symptoms		
No	182	78.8
Yes	49	21.2

4.3 Prevalence of self-medication among public transport drivers in the last 2 months to prevent COVID-19

Self-medication defined as the intake of any medicine or product without consulting a physician was 45.9% (95% CI: 0.34-0.50) among the public transport drivers. Self-medication to prevent COVID-19 infection in the past 2 months without consulting a physician was prevalent among 9.3% (95% CI: 0.02-0.10) of drivers (Figure 1). Prevalence of self-medication was high at 12 (35.3%) among public transport drivers aged 30-39 years and those who were single 19 (55.9%). In addition, 67.6% of the public transport drivers without alternate education were self-medicating. Further, about 61.8% of the public transport drivers without any chronic diseases and 58.8% of those not-insured under the NHIS were self-medicating. Less than half (44.1%) of the public transport drivers who

were slightly afraid of COVID-19 were self-medicating. Also, about 55.9% of public transport drivers self-medicating experienced COVID19 symptoms in the past (Table 4.3).

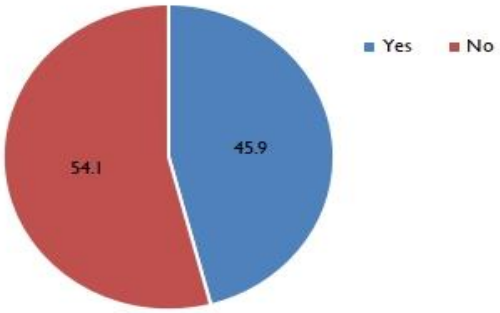

Figure 3: Ever self-medicated

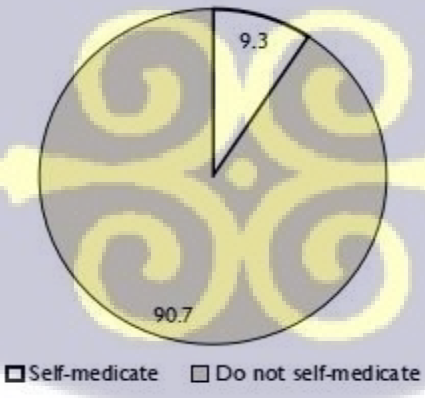

Figure 4: Proportion of public transport drivers who self-medicated to prevent COVID-19 in the past 2 months

4.4 Association between self-medication and socio-demographic characteristics

The Chi-square and fisher's exact tests were conducted to determine the association between self-medication and some socio-demographic characteristics. No significant association was observed between age, marital status, alternate occupation, educational level, religion, ethnicity, having an active NHIS, being afraid of COVID-19, practicing COVID-19 safety protocols, and self-medication. However, there was a significant association between having the chronic disease (p=0.008) and ever experienced COVID-19 symptoms ($\chi 2$=29.411: p<0.001) (Table 4.3).

Table 4.3: Bi-variate analysis of the association between self-medication and co-variates among public transport drivers in La Nkwantanang Madina Municipal district

Variable	Do not self-medicate	Self-medicate	$\chi 2$/ (p-value)
	n (%)		
Age group (years)			
18-29	120 (36.3)	11 (32.3)	
30-39	116 (35.0)	12 (35.3)	
40-49	51 (15.4)	7 (20.6)	
50-59	35 (10.6)	3 (8.8)	
40+	9 (2.7)	1 (2.9)	0.915
Marital status			
Single	185 (55.9)	19 (55.9)	

Currently married	133 (40.2)	14 (41.2)	
Divorced/separated/widowed	13 (3.9)	1 (2.9)	1.000
Alternate occupation			
Formal employment	5 (1.5)	0 (0.0)	
Informal employment	106 (32.0)	11 (32.4)	
No alternate employment	220 (66.5)	23 (67.6)	1.000
Educational level			
No formal education	23 (6.9)	0 (0.0)	
Primary	57 (12.2)	5 (14.7)	
JHS	150 (45.3)	14 (41.2)	
SHS	86 (26.0)	11 (32.3)	
Tertiary	15 (4.5)	4 (11.7)	0.186
Religion			
No religion	37 (11.2)	6 (17.7)	
Christian	211 (63.7)	22 (64.7)	
Islam	79 (23.8)	6 (17.7)	
Traditional	4 (1.2)	0 (0.0)	0.606
Ethnicity			
Ewe	99 (29.0)	5 (14.7)	
Akan	137 (41.4)	15 (44.1)	
Ga	53 (29.9)	7 (20.6)	
Northern tribe	42 (12.7)	7 (20.6)	4.3823 (0.223)

Have any chronic disease			
Yes	24 (7.3)	1 (2.9)	
No	262 (79.1)	21 (61.8)	
Don't know	45 (13.6)	12 (35.3)	**0.008**
Active on NHIS			
Insured	149 (45.0)	20 (58.8)	
Not-insured	182 (55.0)	14 (41.2)	2.236 (0.124)
How much are you afraid of COVID-19			
Not afraid	150 (45.3)	10 (29.4)	
Slightly afraid	108 (32.6)	15 (44.1)	
Very afraid	73 (22.1)	9 (26.5)	3.254 (0.196)
Currently practicing COVID-19 safety protocols			
Yes	96 (29.0)	9 (26.5)	
No	51 (15.4)	3 (8.8)	
Sometimes	184 (55.6)	22 (64.7)	1.357 (0.0507)
Ever experienced COVID-19 symptoms			
No	276 (83.4)	15 (44.1)	
Yes	55 (16.6)	19 (55.9)	29.411 **(<0.001)**

[2]

[2] Fisher's exact test was used where values in a call fell below 5

4.5 Binary logistic regression of factors associated with self-medication

Table 4.4 summarizes the results of univariate and multivariate logistic regression models. In the univariate model, ever experienced COVID-19 symptoms and having chronic disease independently predicted self-medication. Public transport drivers who ever experienced COVID-19 symptoms were 6.35 times more likely to self-medicate compared to those who did not experience any symptom [OR=6.35 (95% CI: 3.04-13.27); p<0.001]. Further, public transport drivers who do not know they have any chronic disease were 3.32 times more likely to self-medicate as compared to those who knew they had chronic disease [OR=3.32 (95% CI: 1.53-7.23); p=0.02]. However, age marital status, religion, educational level, NHIS status, alternate occupation, and adhering to COVID-19 prevention protocol did not predict self-medication.

A mutual adjustment was conducted in the multivariate model where all variables were included in the final model. In the final model, ever experiencing COVID-19 symptoms predicted self-medication. Public transport drivers who ever experienced COVID-19 symptoms were 4.33 times more likely to self-medicate as compared to those who never experience COVID-19 symptoms [OR=4.33 (95% CI: 2.53-11.24); p=0.041]. All other variables were not statistically associated with self-medication.

Table 4.4 Factors associated with self-medication among public transport drivers

Variable	COR	95% CI	p-value	AOR	95% CI	p-value
Age group (years)						
18-29	Ref			Ref		
30-39	1.12	0.47-2.65	0.782	1.14	0.82-3.01	0.612
40-49	1.49	0.55-4.08	0.430	1.55	0.66-3.98	0.298
50-59	0.94	0.24-3.53	0.921	0.50	0.49-4.33	0.951
40+	1.21	0.14-10.47	0.861	1.33	0.18-9.76	0.881
Marital status						
Single	Ref			Ref		
Currently married	1.02	0.49-2.11	0.947	1.26	0.58-3.51	0.867
Divorced/separated/widowed	0.75	0.09-6.04	0.786	0.64	0.11-6.61	0.651
Alternate occupation						
Formal employment	Ref			Ref		
Informal employment	1.18	0.06-22.88	0.909	1.92	0.95-19.98	0.100

No alternate employment	1.17	0.06-21.86	0.915	1.81	0.25-20.99	0.892
Educational level						
No formal education	Ref			Ref		
Primary	4.49	0.23-84.57	0.315	5.68	0.43-66.01	0.426
JHS	4.25	0.26-78.48	0.299	5.38	0.44-68.55	0.311
SHS	6.25	0.35-109.98	0.210	7.46	0.51-89.01	0.320
Tertiary	13.64	0.68-271.70	0.087	15.71	0.88-103.81	0.12
Religion						
No religion	Ref			Ref		
Christian	0.61	0.23-1.57	0.308	0.61	0.23-1.57	0.308

Islam	0.47	0.14-1.49	0.202	0.47	0.14-1.49	0.202
Traditional	0.64	0.03-13.37	0.774	0.64	0.03-13.37	0.774
Ethnicity						
Ewe	Ref			Ref		
Akan	2.04	0.74-5.57	0.165	1.83	0.83-6.61	0.215
Ga	2.25	0.80-8.00	0.113	2.81	1.14-8.11	0.233
Northern tribe	3.19	1.00-10.15	0.059	4.10	0.91-8.89	0.067
Have any chronic disease						
No	Ref			Ref		
Yes	0.51	0.07-4.03	**0.531**	0.37	0.05-3.16	0.373

Don't know	3.32	1.53-7.23	**0.002**	2.25	0.99-5.19	0.066
Active on NHIS						
Insured	Ref			Ref		
Not-insured	0.57	0.27-1.17	0.128	0.67	0.37-1.27	0.158
How much are you afraid of COVID-19?						
Not afraid	Ref					
Slightly afraid	2.08	0.90-4.81	0.086	2.18	0.91-4.82	0.076
Very afraid	1.85	0.72-4.75	0.201	1.76	1.62-4.75	0.211
Currently practicing COVID-19 safety protocols						
Yes	Ref			Ref		
No	0.62	0.16-2.42	0.499	0.74	0.28-3.54	0.501
Sometimes	1.27	0.57-2.87	0.555	2.37	0.76-1.98	0.643
Ever experience COVID-19 symptoms						

No	Ref			Ref		
Yes	6.35	3.04-13.27	**<0.001**	4.23	2.53-11.24	**0.041**

Note

cOR-crude odds ratio

aOR: Adjusted odds ratio

95% CI: 95% confidence interval

4.6 Commonly used drugs to self-medicate for COVID-19 prevention

Public transport drivers who self-medicate were also assessed on some of the commonly used drugs. The most common medications used by the public transport drivers to self-medicate were Vitamin C (55%), Ibuprofen (27.5%), Zinc (15%), and Amoxicillin (12.5%). Azithromycin (7.5%) and Hydroxychloroquine (7.5%) were the least used self-medicating drugs (Figure 2)

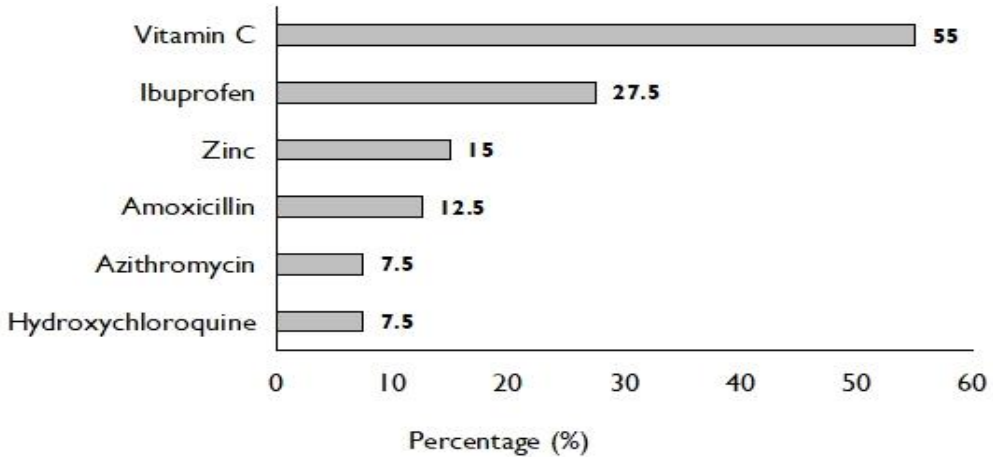

Figure 5: Commonly self-medicated drugs among public transport drivers

4.7 Use of Herbal foods/ products to prevent Covid-19

Public transport drivers were also assessed on the use of herbal foods or products to prevent COVID-19. Results have shown that an estimated 21.1% (95% CI: 0.11 – 34.87) of the drivers used herbal foods/products to prevent COVID-19 in the past two months. The majority (78.8%: 95% CI: 0.67-0.81) did not use any herbal foods/products to prevent COVID-19 in the past two (2) months (Figure 3)

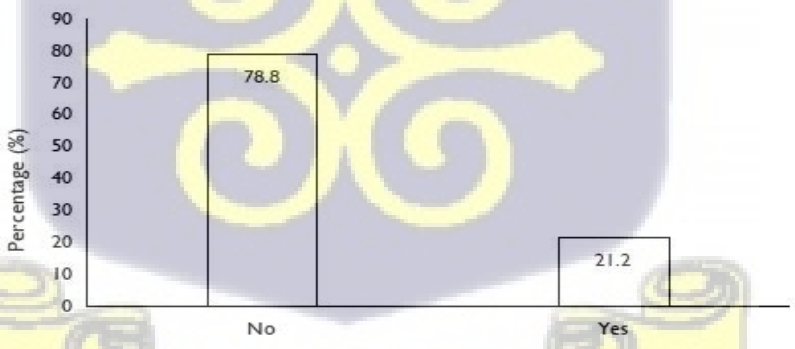

Figure 6: Proportion of public transport drivers who use herbal foods/products to prevent COVID-19

4.8 Herbal foods/ products commonly used to prevent Covid-19

Out of those who use herbal foods or products to prevent COVID-19, public transport drivers were further assessed on the commonly used herbal products. The most predominating herbal product used to prevent COVID-19 was products (such as the leaf) of the Neem tree (29%). Less used products were herbal preparations (9%), bitters (8%), ginger (8%), dandelion (7%), and lime (7%). The least used herbal foods/products were mahogany (2%), moringa (2%) Sowers herbal mixture (2%), tea (2%), turmeric (1%), and onions (1%) (Figure 4).

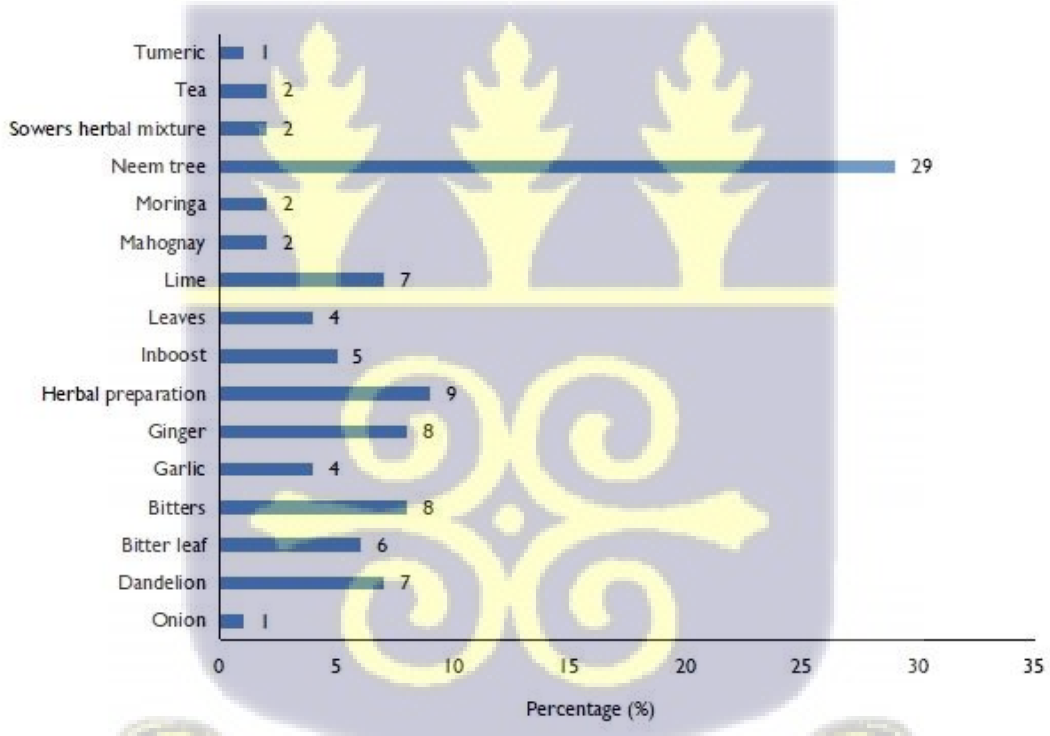

Figure 7: Commonly used foods/products to prevent COVID-19

CHAPTER FIVE

5.0 DISCUSSIONS

5.1 Introduction

This study is to first explore self-medication among public transport drivers in Ghana. Despite strict warnings from the WHO and local agencies not to self-medicate, 9.3% of the public transport drivers in this study used medicines to prevent COVID-19 without consulting a physician. Findings from this study are however lower than what was found among the general population in Togo (34.2%), Dhaka (88.3%), Bangladesh (15.8%), Uganda (57%), Nigeria (41%), Saudi Arabia (35.1%) and among students in Peru (51.3%) (Ahmed et al., 2020; Dare et al., 2020; Mansuri et al., 2020; Nasir et al., 2020; Sadio et al., 2021; Villena-Tejada et al., 2021; Wegbom et al., 2021) The reason for the high prevalence of self-medication observed in these studies could be because these studies were conducted in the peak of the outbreak were etiology of the disease was still not fully known. On the contrary, the low prevalence of self-medication found in this study could probably be related to intensified health education on self-medication, the ongoing COVID-19 vaccination in the country, and because at the time of the study, the wave of the pandemic in Ghana was at its low and so there was not much fear or panic. The low wave was believed to mean the virus had stopped attacking or the pandemic was resolving and so there was not much need of panicking. It is therefore estimated that when the wave goes up, drivers will be compelled to protect themselves more by self-medicating.

In addition, this current study comprised only male participants, unlike other studies where both females and males participated causing an increase in self-medication since females are more conscious of their health compared to males, and in the context of the COVID-19

outbreak, greater anxiety among women was found in Iran (Moghanibashi-Mansourieh, 2020) and Italy (Casagrande et al., 2020).

Although responsible self-medication is often seen to reduce the cost of treatment and time spent visiting health facilities as well as ease treatment of life-threatening conditions, its health consequences such as delay in treatment, the occurrence of adverse drug reactions, drug-drug interactions, and antimicrobial resistance is an entrenched global health challenge.

The practice of self-medication among public transport drivers was mainly geared towards infection prevention. In this study, the most used medicine without physician advice was Vitamin C. This agrees with the study conducted in Togo where Vitamin C was identified as the most commonly used product to self-medicate (Sadio et al., 2021). A plausible reason for the increased patronage of Vitamin C could be the low cost of Vitamin C and its availability. In addition, health care providers, publications, and social media have demonstrated a positive impact of Vitamin C (Ferraro et al, 2016). Also, the high use of Vitamin C could be linked to its effectiveness in the management of COVID-19 particularly in boosting the immune system as reported in some studies (Abobaker et al., 2020; Hemilä & Chalker, 2020). Nonetheless, it is imperative to note that, a high dose of Vitamin C may cause side effects such as the risk of kidney stones (Ferraro et al., 2016). In addition, Azithromycin and Hydroxychloroquine were the least used self-medicating drugs in this study. Azithromycin and Hydroxychloroquine were used by only 7.5% of drivers to self-medicate. The low patronage was similar to the study conducted in Togo where only 1.2% of the total sample used Azithromycin to self-medicate. The decreased usage of Azithromycin could be attributed to the known negative impact it has on patients,

thus capable of causing harm and increasing the risk of antimicrobial infection. Also, the relatively costly nature of the drug could explain low patronage. Other drugs such as Ibuprofen, Zinc, and amoxicillin were moderately used by public transport drivers in this study to self-medicate. This pattern is similar to what has been reported in a study conducted in Bangladesh where zinc among other supplements was the most commonly used preventive medicine used during the COVID-19 pandemic (Ahmed et al., 2020). The adverse effects of these self-medicating drugs are of public health concern such as anti-biotic resistance and arrhythmia caused by hydroxychloroquine. This poses a major risk to primary prevention strategies. It is thus important to improve individual knowledge in such a way that the damages of this practice can be prevented. Also, health authorities should emphasize on responsible use of non-prescription medications.

In this present study, previous experience with COVID-19 was the most important factor associated with self-medication. Public transport drivers who previously experienced any COVID-19 symptoms were more likely to self-medicate compared to those who never experienced any COVID-19 related symptoms. Perhaps the associated discomfort with these symptoms experienced by these drivers could encourage them to patronize medications to prevent reoccurring of such symptoms.

This study showed no significant association between age, level of education, and NHIS status. These can be considered logical as most of the respondents did not have much fear for the COVID-19 disease as some believed it was not a real disease and so were not paying much attention to practicing safety measures. This means they would not bother to try to protect themselves against contracting the disease except as proven by this study either having a previous experience with COVID-19 or some chronic disease.

Aside from the use of medicines to prevent COVID-19, the use of herbal foods/products was assessed. The use of herbal foods and products to prevent COVID-19 infection seems usual worldwide (Chaachouay et al., 2021; Nugraha et al., 2020). Concurrently, a series of herbs are believed without empirical evidence to be effective in relieving or treating symptoms. Also, many governments have authorized the use of such products to treat COVID-19 (Huang et al., 2020) In this study, about 2 in 10 drivers used herbal foods or products to prevent COVID-19 infection. A much higher prevalence of the use of herbal preparations to prevent COVID-19 was reported in Peru (Villena-Tejada et al., 2021). In that study, about 71% used medicinal plants for the treatment of COVID-19 respiratory symptoms. Similarly, a study conducted in Nepal has found increasing use of medicinal plants during the COVID-19 pandemic (Khadka et al., 2021) Also, a much higher prevalence was found in Ethiopia, where about 46% of participants used traditional medicines to prevent and treat COVID-19 (Chali et al., 2021) Also, a study conducted in India, Hong Kong, and Bangladesh found prevalence of herbal medicine used to be 25.8%, 44%, and 57.6% respectively (Ahmed et al., 2020; Charan et al., 2021; Lam et al., 2021). A major reason for the discrepancy in the use of herbal products could be due to study participants. Unlike this study, the study participants of the Indian study were patients in isolation centers with suspected COVID-19 infection. The significant increase in the use of herbal products compared to medicines in this study could probably be because these are readily available in most households and markets in Ghana.

Despite the availability of many herbal foods/products, products from *the Neem tree*, alongside herbal preparations, *ginger* and *bitters* were commonly used among drivers in this study. In a study conducted in Bangladesh, about 71% of them took tea (normal and

herbal), while other herbal foods such as ginger, black seed, honey, and clove were used by 56.5%, 32.8%, 30%, and 28.8% respectively (Ahmed et al., 2020). It should, however, be noted that the use of herbal foods/products could be habitual and participants might have taken them with no knowledge of their association with COVID-19.

The results of this study imply that the COVID-19 pandemic even though has caused a worldwide panic, did not have much regard from the drivers probably because public education towards this group of the population was not adequately reached. Even though self-medication to prevent COVID-19 was prevalent at 9.3% which is quite low as compared to other studies, drivers generally self-medicated at a higher prevalence (45.9%) and this is a cause for concern. Major stakeholders such as the Ministry of Health, Ghana Health Service, and Pharmacy council of Ghana should strengthen public health education on COVID-19 as well as the proper use of drugs and the harmful effects of self-medication. Also, it is evident from the study that, even though some of the medications used are considered to be over-the-counter medications, others such as Amoxicillin, Azithromycin and hydroxychloroquine are considered to be prescription only medications and in that regard, the above mentioned stakeholders need to strengthen strict policies to regulate the sale of these drugs without prescriptions from a qualified practitioner, counter personnel in these facilities need to be appropriately licensed and qualified and advertisement of drugs strictly regulated.

5.2 Limitation of the study

Limitations encountered during the study include the following:

Firstly, the likelihood of biased answers from the researcher administered questionnaire by the researcher, given the fact that respondents may want to deny ever having self

medicated and thus create a good impression of themselves for the researcher. This may have affected the accuracy of responses concerning the prevalence of self-medication among respondents.

Lastly, because of the complex names of some of the medicines, it was difficult for some subjects to mention the names of the medications which they used for self-medication.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

This study is to determine the prevalence of self-medication practices for COVID-19 prevention among public transport drivers in La-Nkwantanang Madina Municipal District. Less than 10% of public transport drivers were reported to self-medicate by using medicines without consulting a physician. The use of herbal foods or products to self-medicate was significantly higher than drugs. Vitamin C and products from the *Neem tree* were the most commonly used medicines and herbal products respectively. Azithromycin and hydroxychloroquine were the least self-medicated drugs. With regards to herbal products and onion was the least self-medicated drug. Public transport drivers with previous experience with COVID-19 symptoms were more likely to self-medicate compared to those without any previous experience.

6.2 Recommendations

- Health promotion officers at the district directorates as well as primary healthcare staff, should intensify education on self-medication among vulnerable populations particularly those with previous reported COVID-19 symptoms as well as those suspected and conformed to have COVID-19. They should be counseled to seek medical aid and continue to observe the recommended COVID-19 prevention measures.
- The Pharmacy council must collaborate with the Ministry of Health, to ensure strict adherence to drug advertisement and sale policies.

- Further research is recommended to be done to study self-medication in general among public transport drivers and the perceived use of common drugs for self-medication.
- The National Health Insurance scheme can collaborate with the La-Nkwantanang Madina Municipal District to organize a subsidized NHIS card registration and renewal for the public transport drivers to encourage them to access proper health care services. Also. the Municipal District can collaborate with surrounding health facilities and Non-Governmental Organizations to organize health screenings and education for the public transport drivers in the comfort of their work stations.

REFERENCES

Abobaker, A., Alzwi, A., & Alraied, A. H. A. (2020). Overview of the possible role of vitamin C in management of COVID-19. In *Pharmacological Reports* (Vol. 72, Issue 6, pp. 1517–1528). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/s43440-020-00176-1

Acheampong, T., Akorsikumah, E. A., Osae-Kwapong, J., Khalid, M., Appiah, A., & Amuasi, J.
H. (2021). Examining vaccine hesitancy in sub-Saharan Africa: A survey of the knowledge and attitudes among adults to receive covid-19 vaccines in Ghana. *Vaccines*, *9*(8). https://doi.org/10.3390/vaccines9080814

Agyei-Boateng, R. (2015). *Self-Medication Practices Among Pregnant Women in Ejisu-Juaben Municipality in Partial Fulfillments For The Award Of Master Of Public Health Degree*. Kwame Nkrumah University of Science and Technology.

Ahmed, I., Hasan, M., Akter, R., Sarkar, B. K., Rahman, M., Sarker, M. S., & Samad, M. A. (2020). Behavioral preventive measures and the use of medicines and herbal products among the public in response to Covid-19 in Bangladesh: A cross-sectional study. *PLoS ONE*, *15*(12 December). https://doi.org/10.1371/journal.pone.0243706

Aishwaryalakshmi, Sasikala, Sreelalitha, Vigneshwaran, & Padmanabha. (2012). Assessment of Knowledge Perception and Attitudes on Medications in General Population. *Indian Journal of Pharmacy Practice*, *5*(3), 3–6.

Araia, Z. Z., Gebregziabher, N. K., & Mesfun, A. B. (2019). Self-medication practice and associated factors among students of Asmara College of Health Sciences, Eritrea: a cross sectional study. *Journal of Pharmaceutical Policy and Practice*, *12*(1), 3. https://doi.org/10.1186/s40545-019-0165-2

Aziz, K., Gholamrheza, S., Yousef, S., & Siamak, M. (2015). Associations between self-medication, Health literacy, and self-perceived health status: A community-based study. https://dx.doi.org/10.4103%2F2008-7802.161264

Bar-Zeev, N., & Inglesby, T., (2020). COVID-19 vaccines: early success and remaining challenges. *The Lancet. 396* (10255),868-869. https://doi.org/10.1016/S0140-6736(20)31867-5

Befekadu, A., Dekama, N. H., & Adem, M. (2014). Self-medication and Contributing Factors among Pregnant Women Attending Antenatal Care in Ethiopia: The Case of Jimma University Specialized Hospital, *3*(1), 969–981.

Biduki, T. Y.K., (2013). The effect of advertisement on self-medication: Case study of Ejura- Sekyedumase Municipality.

Bright, B., Babalola, C. P., Sam-Agudu, N. A., Onyeaghala, A. A., Olatunji, A., Aduh, U., Sobande, P. O., Crowell, T. A., Tebeje, Y. K., Phillip, S., Ndembi, N., & Folayan, M. O. (2021). COVID-19 preparedness: capacity to manufacture vaccines, therapeutics and diagnostics in sub-Saharan Africa. *Globalization and Health*, *17*(1), 24. https://doi.org/10.1186/s12992-021-00668-6

Busari S, Adebayo B. Nigeria records chloroquine poisoning after Trump endorses it for coronavirus treatment. 2020 [Cited 20/11/21]. Available from: https://edition.cnn.com/2020/03/23/africa/chloroquine-trump-nigeria-intl/index.html.

Casagrande, M., Favieri, F., Tambelli, R., & Forte, G. (2020). The enemy who sealed the world: effects quarantine due to the COVID-19 on sleep quality, anxiety, and psychological distress in the Italian population. *Sleep Medicine*, *75*, 12–20. https://doi.org/10.1016/j.sleep.2020.05.011

Chaachouay, N., Douira, A., & Zidane, L. (2021). COVID-19, prevention and treatment with herbal medicine in the herbal markets of Salé Prefecture, North-Western Morocco. *European Journal of Integrative Medicine*, *42*. https://doi.org/10.1016/j.eujim.2021.101285

Chali, B. U., Melaku, T., Berhanu, N., Mengistu, B., Milkessa, G., Mamo, G., Alemu, S., & Mulugeta, T. (2021). Traditional medicine practice in the context of covid-19 pandemic: Community claim in Jimma zone, Oromia, Ethiopia. *Infection and Drug Resistance*, *14*, 3773–3783. https://doi.org/10.2147/IDR.S331434

Chamie-Quintero, J., Hibberd, J., Scheim, D. (2021). Ivermectin for COVID-19 in Peru*: 14-fold reduction in nationwide excess deaths, p<0.002 for effect by state, the 13-fold increase after ivermectin use restricted.* https://doi.org/10.31219/osf.io/9egh4

Charan, J., Bhardwaj, P., Dutta, S., Kaur, R., Bist, S. K., Detha, M. D., Kanchan, T., Yadav, D., Mitra, P., & Sharma, P. (2021). Use of Complementary and Alternative Medicine (CAM) and Home Remedies by COVID-19 Patients: A Telephonic Survey. *Indian Journal of Clinical Biochemistry*, *36*(1), 108–111. https://doi.org/10.1007/s12291-020-00931-4

Cherian D. COVID-19: Avoid self-medication and false « cures » when battling coronavirus. 2020 [Cited 20/05/20]. Available from: https://gulfnews.com/world/americas/covid-19-avoid-self-medication-and-false-cures-when- battling-coronavirus-1.1585042404259.

Chopra, D., Bhandari, B., Sidhu, J., Jakhar, K., Jamil, F., & Gupta, R. (2021). Prevalence of self-reported anxiety and self-medication among upper and middle socioeconomic strata amidst COVID-19 pandemic. *Journal of Education and Health Promotion*, *10*(1), 73. https://doi.org/10.4103/jehp.jehp_864_20

Dare, S. S., Daniel Eze, E., Isaac, E., Usman, I. M., Ssempijja, F., Bukenya, E. E., & Ssebuufu, R. (n.d.). *COVID-19 PANDEMIC AND BEHAVIOURAL RESPONSE TO SELF-MEDICATION PRACTICE IN WESTERN UGANDA*. https://doi.org/10.1101/2021.01.02.20248576

Diterjemahkan dari Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., Zhang, L., Fan, G., Xu, J., & Adriani, N. P. V. (n.d.). *GEJALA KLINIS PASIEN TERINFEKSI NOVEL CORONAVIRUS 2019 DI WUHAN, CHINA*.

Donkor, E., Tetteh-Quarcoo, P., Nartey, P., & Agyeman, I. (2012). Self-Medication Practices with Antibiotics among Tertiary Level Students in Accra, Ghana: A Cross-Sectional Study. *International Journal of Environmental Research and Public Health*, *9*(10), 3519–3529. https://doi.org/10.3390/ijerph9103519

Emmanuel, A., Achema, G., Afoi, B. B., & Maroof, R. (2014). Self-medication practice among pregnant women attending antenatal clinic in selected hospitals in Jos, Nigeria. *International Journal of Nursing and Health Science*, *1*(6), 55–59.

Ferraro, P. M., Curhan, G. C., Gambaro, G., & Taylor, E. N. (2016). Total, dietary, and supplemental Vitamin C intake and risk of incident kidney stones. *American Journal of Kidney Diseases*, *67*(3), 400–407. https://doi.org/10.1053/j.ajkd.2015.09.005

Figueiras, A., Caamaño, F., & J Gestal Otero, J. (2000). [Methodology of Drug Utilization Studies in Primary Health Care]. *Gaceta Sanitaria / S.E.S.P.A.S*, *14*(Suplemento 3), 7–19.

Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*, *24*(2), 105–112. https://doi.org/10.1016/j.nedt.2003.10.001

Hemilä, H., & Chalker, E. (2020). Vitamin C as a Possible Therapy for COVID-19. In *Infection and Chemotherapy* (Vol. 52, Issue 2, pp. 222–223). Korean Society of Infectious Diseases, Korean Society for Antimicrobial Therapy, Korean Society for AIDS. https://doi.org/10.3947/ic.2020.52.2.222

Hogan, A., Jewell, B., Sherrard-Smith, E., Vesga, J., Watson, O., Whittaker, C., Hamlet, A., Smith, J., Winskill, P., Verity, R., Baguelin, M., Lees, J., Whittles, L., Ainslie, K., Bhatt, S., Boonyasiri, A., Brazeau, N., Cattarino, L., Cooper, L., … Hallett, T. (2020). Potential impact of the COVID-19 pandemic on HIV, tuberculosis, and malaria in low-income and middle-income countries: a modelling study. *The Lancet Global Health*, *20*, 1–10. https://doi.org/10.1016/S2214-109X(20)30288-6

Huang, J., Tao, G., Liu, J., Cai, J., Huang, Z., & Chen, J. X. (2020). Current Prevention of COVID-19: Natural Products and Herbal Medicine. In *Frontiers in Pharmacology* (Vol. 11). Frontiers Media S.A. https://doi.org/10.3389/fphar.2020.588508

James, P. B., Wardle, J., Steel, A., & Adams, J. (2018). Traditional, complementary and alternative medicine use in Sub-Saharan Africa: A systematic review. *BMJ Global Health*, *3*(5). https://doi.org/10.1136/bmjgh-2018-000895

Kassie, A. D., Bifftu, B. B., & Mekonnen, H. S. (2018). Self-medication practice and associated factors among adult household members in Meket district, Northeast Ethiopia, 2017. *BMC Pharmacology and Toxicology*, *19*(1), 15. https://doi.org/10.1186/s40360-018-0205-6

Kenu, E., Frimpong, J. A., & Koram, K. A. (2020). Responding to the covid-19 pandemic in Ghana. In *Ghana Medical Journal* (Vol. 54, Issue 2, pp. 72–73). Ghana Medical Association. https://doi.org/10.4314/gmj.v54i2.1

Khadka, D., Dhamala, M. K., Li, F., Aryal, P. C., Magar, P. R., Bhatta, S., Thakur, M. S., Basnet, A., Cui, D., & Shi, S. (2021). The use of medicinal plants to prevent COVID-19 in Nepal. *Journal of Ethnobiology and Ethnomedicine*, *17*(1). https://doi.org/10.1186/s13002-021-00449-w

Koffman, J., Gross, J., Etkind, S. N., & Selman, L. (2020). Uncertainty and COVID-19: how are we to respond? In *Journal of the Royal Society of Medicine* (Vol. 113, Issue 6, pp. 211–216). SAGE Publications Ltd. https://doi.org/10.1177/0141076820930665

Kohler, J. C., & Mackey, T. K. (2020). Why the COVID-19 pandemic should be a call for action to advance equitable access to medicines. *BMC Medicine*, *18*(1), 193. https://doi.org/10.1186/s12916-020-01661-3

Kong, J. D., Tchuendom, R. F., Adeleye, S. A., David, J. F., Admasu, F. S., Bakare, E. A., & Siewe, N. (2021). SARS-CoV-2 and self-medication in Cameroon: a mathematical model. *Journal of Biological Dynamics*, *15*(1), 137–150. https://doi.org/10.1080/17513758.2021.1883130

Kretchy, J.-P., Adase, S. K., & Gyansa-Lutterodt, M. (2021). The prevalence and risks of antibiotic self-medication in residents of a rural community in Accra, Ghana. *Scientific African*, *14*, e01006. https://doi.org/10.1016/j.sciaf.2021.e01006

Kumar, N., Kanchan, T,. Unnikrishnan, B., Rekha, T., Mithra, P., Kulkarni, V., Papanna, K. M., Holla, R., & Uppal, S. (2013). Perception and practicesof Self-medication among Medical Students in Coastal South India. *Plos One, https://doi.org/10.1371/journal.pone.0072247*

Lam, C. S., Koon, H. K., Chung, V. C. H., & Cheung, Y. T. (2021). A public survey of traditional, complementary and integrative medicine uses during the COVID-19 outbreak in Hong Kong. *PLoS ONE*, *16*(7 July). https://doi.org/10.1371/journal.pone.0253890

Liu, Q., Luo, D., Haase, J. E., Guo, Q., Wang, X. Q., Liu, S., Xia, L., Liu, Z., Yang, J., & Yang, B. X. (2020). The experiences of health-care providers during the COVID-19 crisis in China: a qualitative study. *The Lancet Global Health*, *8*(6), e790–e798. https://doi.org/10.1016/S2214-109X(20)30204-7

Mahmoud, H., Mahdi, A., Zahra, K., Ali, B., Ramin, R., & Kaveh, T. (2021). Knowledge, attitude, and practice of pharmacy and medical students regarding self-medication, a study in Zabol University of Medical Sciences; Sistan and Baluchestan province in south-east of Iran

Malik, M., Tahir, M. J., Jabbar, R., Ahmed, A., & Hussain, R. (2020). Self-medication during Covid-19 pandemic: challenges and opportunities. In *Drugs and Therapy Perspectives* (Vol. 36, Issue 12, pp. 565–567). Adis. https://doi.org/10.1007/s40267-020-00785-z

Mansuri, F. M. A., Zalat, M. M., Khan, A. A., Alsaedi, E. Q., & Ibrahim, H. M. (2020). Estimating the public response to mitigation measures and self-perceived behaviours towards the COVID-19 pandemic. *Journal of Taibah University Medical Sciences*, *15*(4), 278–283. https://doi.org/10.1016/j.jtumed.2020.06.003

Mbarambara, M., Songa, B., Wansubi, M., Mututa, M., Minga, B. K., & Bisangamo, K. (2016). Self-medication practice among pregnant women attending antenatal care at health centers in Bukavu, Eastern DR Congo. *International Journal of Innovation and Applied Studies*, *16*(1), 38–45.

Moghanibashi-Mansourieh, A. (2020). Assessing the anxiety level of Iranian general population during COVID-19 outbreak. *Asian Journal of Psychiatry*, *51*. https://doi.org/10.1016/j.ajp.2020.102076

Nasir, M., Chowdhury, A. S. M. S., & Zahan, T. (2020). Self-medication during COVID-19 outbreak: a cross sectional online survey in Dhaka city. *International Journal of Basic & Clinical Pharmacology*, *9*(9), 1325. https://doi.org/10.18203/2319-2003.ijbcp20203522

Nonvignon, J. M KS Aikins, M.K.S, Chimbuah, M.A, Gyapong, M. A.M, Garshong, B. N.A. Savior Fia, and Gyapong J.O(2010) "treatment choice for fever in children under – five years in rural Ghanaians districts" Malaria journal

Nugraha, R. V., Ridwansyah, H., Ghozali, M., Khairani, A. F., & Atik, N. (2020). Traditional Herbal Medicine Candidates as Complementary Treatments for COVID-19: A Review of Their Mechanisms, Pros and Cons. In *Evidence-based Complementary and Alternative Medicine* (Vol. 2020). Hindawi Limited. https://doi.org/10.1155/2020/2560645

Oluwole A. B., Olusesan, J. F., Olujide, J. O., Kabir A. D., Oladele, A., A., Oladapo, P., A. & Temitope, O. (2016). Self-medication among health workers in a tertiary institution in South-West Nigeria. https://dx.doi.org/10.11604%2Fpamj.2016.24.312.8146

Owings, L. (2020). Africa not ready for COVID-19 Mental Health Issues. Available online at https://www.scidev.net/sub-saharan-africa/health/news/africa-notready-for-COVID-19-mental-health-issues.html.

Phua, J., Weng, L., Ling, L., Egi, M., Lim, C. M., Divatia, J. V., Shrestha, B. R., Arabi, Y. M., Ng, J., Gomersall, C. D., Nishimura, M., Koh, Y., & Du, B. (2020). Intensive care management of coronavirus disease 2019 (COVID-19): challenges and recommendations. *The Lancet Respiratory Medicine*, *8*(5), 506–517. https://doi.org/10.1016/S2213-2600(20)30161-2

Quispe-Cañari, J. F., Fidel-Rosales, E., Manrique, D., Mascaró-Zan, J., Huamán-Castillón, K. M. , Chamorro–Espinoza, S. E., Garayar–Peceros, H., Ponce–López, V. L., Sifuentes-Rosales, J., Alvarez-Risco, A., Yáñez, J. A., & Mejia, C. R. (2021). Self-medication practices during the COVID-19 pandemic among the adult population in Peru: A cross-sectional survey. *Saudi Pharmaceutical Journal*, *29*(1), 1–11. https://doi.org/10.1016/j.jsps.2020.12.001

Rakedzon, S., Neuberger, A., Domb, A. J., Petersiel, N., & Schwartz, E. (2021). From hydroxychloroquine to ivermectin: what are the anti-viral properties of anti-parasitic drugs to combat SARS-CoV-2? *Journal of travel medicine*, *28*(2), taab005. https://doi.org/10.1093/jtm/taab005

Sadio, A. J., Gbeasor-Komlanvi, F. A., Konu, R. Y., Bakoubayi, A. W., Tchankoni, M. K., Bitty-Anderson, A. M., Gomez, I. M., Denadou, C. P., Anani, J., Kouanfack, H. R., Kpeto, I. K., Salou, M., & Ekouevi, D. K. (2021). Assessment of self-medication practices in the context of the COVID-19 outbreak in Togo. *BMC Public Health*, *21*(1). https://doi.org/10.1186/s12889-020-10145-1

Sisay, M., Mengistu, G., & Edessa, D. (2018). Epidemiology of self-medication in Ethiopia: a systematic review and meta-analysis of observational studies. *BMC Pharmacology and Toxicology*, *19*(1). https://doi.org/10.1186/s40360-018-0248-8

Tesfamariam, S., Anand, I. S., Kaleab, G., Berhane, S., Woldai, B., Habte, E., & Russom, M. (2019). Self-medication with over-the-counter drugs, prevalence of risky practice and its associated factors in pharmacy outlets of Asmara, Eritrea. *BMC Public Health*, *19*(1), 159. https://doi.org/10.1186/s12889-019-6470-5

Togoobaatar, Napolitano, F., Izzo, M. T., Di Giuseppe, G., & Angelillo, I. F. (2010). Public Knowledge, Attitudes, and Experience Regarding the Use of Antibiotics in Italy. *PLoS ONE*, *8*(12), e84177.

United Nations. (2018). Department of Economic and Social Affairs.

Van den Boom, G.J.M, Nsowah-Nuamah, N.N.N, Overbosch, G.B. (2008). Health-Care Provision and Self-Medication in Ghana. https://research.vu.nl/en/publications/health-care-provision-amp-self-medication-in-ghana.

Villena-Tejada, M., Vera-Ferchau, I., Cardona-Rivero, A., Zamalloa-Cornejo, R., Quispe-Florez, M., Frisancho-Triveño, Z., Abarca-Meléndez, R. C., Alvarez-Sucari, S. G., Mejia, C. R., & Yañez, J. A. (2021). Use of medicinal plants for COVID-19 prevention and respiratory symptom treatment during the pandemic in Cusco, Peru: A cross-sectional survey. In *PLoS ONE* (Vol. 16, Issue 9 September). Public Library of Science. https://doi.org/10.1371/journal.pone.0257165

Wegbom, A. I., Edet, C. K., Raimi, O., Fagbamigbe, A. F., & Kiri, V. A. (2021). Self-Medication Practices and Associated Factors in the Prevention and/or Treatment of COVID-19 Virus: A Population-Based Survey in Nigeria. *Frontiers in Public Health*, *9*. https://doi.org/10.3389/fpubh.2021.606801

WHO. (2010). The Pursuit of Responsible Use of Medicines: Sharing and Learning from Country Experiences. Essential Medicines and Health Products Information Portal, 338.

WHO. Coronavirus disease 2019 (COVID-19) situation report 93. World Health Organization, 2020. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200422-sitrep-93covid-19.pdf?sfvrsn=35cf80d7_4 (accessed July 29, 2020).

Yusuff, K. B., & Omarusehe, L. D. (2011). Determinants of self-medication practices among pregnant women in Ibadan, Nigeria. *International Journal of Clinical Pharmacy*, *33*(5), 868–875.

APPENDIX 1

Appendix 1: Informed consent form

Study title: Prevalence and determinants of self-medication practices for covid-19 prevention among public transport drivers in La-Nkwantanang Madina municipal district.

Ruth Asantewaa Forson, Department of Health Policy, Planning and Management, School of Public Health, College of health sciences, University of Ghana. P. O Box LG 73, Legon.

Contact number: 0264710050

Email address: ruthasaforson@gmail.com

General Information about the study

This study is been undertaken as a requirement for completion at the University of Ghana, School of Public health. The study is useful for planning public health education programs and can be used both at the local and international level.

Although self-medication may be well known by the general population especially among public transport drivers, the exact prevalence and factors associated with it may not be clearly known. For this reason, I seek to carry out this study to determine the prevalence and determinants of self-medication among public transport drivers as well as drugs and herbal preparations often used to self-medicate. Duration of the study is less than a year. Findings from this study will serve as a baseline to help formulate strategies to reduce the prevalence of self-medication, to reduce drug resistance and improve the quality of life of the drivers.

Procedures

Public transport drivers registered with the Amot Transport union, Top transport union, GPRTU and PROTOA will be used in this study. Eligible participant who agrees to participate will answer a questionnaire through direct interview. Questions will be asked about your background, factors influencing self-medication and medications commonly used for self-medication.

Possible benefits

There is no direct benefit to participating in this study. The findings will be used for planning of public health education purposes. Also, findings from this study will serve as basis to formulate policies to reduce self-medication drug resistance and improve on quality of health.

Possible risk and discomforts

There is no perceived risk or harm to you in person or self-esteem. You will not be denied access to any medication nor services for participating in this study. Your little time you will spend with us is however the only discomfort you will have.

Right to refuse and voluntary participation

This is not a compulsory study. You agree to participate in this study out of free will and can also choose not to participate. Once you agree to participate, you are at liberty to stop when you want to without being penalized.

Confidentiality

Participating in this study will be appreciated but not participating will have no negative effect on you nor the study. Your name nor any personal detail that could help identify you are not required in this study. Every information gotten from you, will be kept safe

and confidential and lock. Access however will be granted to the researcher and the research supervisor

Kindly contact the below persons in case you have any questions

Ruth Asantewaa Forson

Department of Health Policy, Planning and Management

University of Ghana

P.O Box LG 73, Legon

Contact 0264710050

Email: ruthasaforson@gmail.com

Your rights as a research participant

If you have any concerns about your rights as a participant, kindly contact the person below

Hannah Frimpong

GHS-Ethical Review Committee

Research and Development Division

Ghana Health Service

P. O. Box MB 190, Accra

Office: 0302 681 109

Mobile: 024 451 6482 Email: Hannah.Frimpong@ghsmail.org

PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and all questions satisfactorily explained to me in a language I understand English and Twi. I fully understand the contents and any potential implications as well as my right to change my mind (i.e. withdraw from the research) even after I

have signed this form.

I voluntarily agree to be part of this research.

Name of Participant…….

Participants' Signature ……...OR Thumb Print……

Date: ……

INTERPRETERS' STATEMENT

I interpreted the purpose and contents of the Participants' Information Sheet to the afore named

participant to the best of my ability in the English and Twi language to his proper understanding.

All questions, appropriate clarifications sort by the participant and answers were also duly

interpreted to his/her satisfaction.

Name of Interpreter……

Signature of Interpreter…….. OR Thumb Print

…….....

Date……

Contact Details

STATEMENT OF WITNESS

I was present when the purpose and contents of the Participant Information Sheet was read and

explained satisfactorily to the participant in the language he/she understood English and Twi

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same

were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name……

Signature…….. OR Thumb Print …….....

Date……

INVESTIGATOR STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to read and learn about the study. All

questions and clarifications raised by the participant have been addressed.

Researcher's name……

Signature …….

Date…….

APPENDIX 2

QUESTIONNAIRE ON THE PREVALENCE AND DETERMINANTS OF SELF-MEDICATION PRACTICES FOR COVID-19 AMONG PUBLIC TRANSPORT DRIVERS IN LA NKWANTANANG MADINA MUNICIPAL DISTRICT

TIME INTERVIEW STARTED:

Introduction

I am …… a student of University of Ghana. I am here with a team of researchers from the School of Public Health, University of Ghana to carry out research on the prevalence and determinants of self-medication practices for COVID-19 among public transport drivers in La-Nkwantanang Madina Municipal District. We will ask you a few questions. We assure you that any information collected will be kept confidential. General findings will be made available to relevant authorities for the purpose of making important decisions and conclusions. The interview will last about 10 minutes.

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION

Questionnaire ID:

QUES ID	QUESTION	RESPONSE
1.	How old are you?	
2	What is your gender?	1. Male

		2. Female
3	What is your highest level of education?	1. No formal education 2. Primary School 3. JHS/JSS 4. SHS/SSS 5. Tertiary
4	Monthly income	1. <GHS 100 2. GHS 100-500 3. GHS 501-1000 4. >GHS 1000
5	What is your marital status?	1. Single 2. Married 3. Divorce/Separated 4. Widowed
6	What is your religion?	1. Christianity 2. Islam 3. Traditional 4. Others, specify……
7	National Health Insurance status	1. Insured 2. Not insured
8	What tribe do you belong to?	1. Akan

		2. Ewe 3. Ga 4. Dagomba 5. Other, Specify…….

SECTION B: PREVALENCE OF SELF-MEDICATION

I will ask you a few questions about self-medication and the drugs you use

1. How much are you afraid of Covid-19?
   a. Not afraid
   b. Slightly afraid
   c. Very afraid
2. Are you practicing the COVID-19 safety protocols? (Hand-washing, wearing nose mask, social distancing, sanitizing)
   a. Yes
   b. No
   c. Sometimes
3. Have you experienced any symptoms related to Covid-19 in the past 2 months (fever, dry cough, difficulty breathing, tiredness, sore throat, etc.?)
   a. Yes, specify……
   b. No
4. Did you take any herbal food/product before experiencing Covid-19 related symptoms as a preventive measure against Covid-19 infection in the past 2 months?
   a. Yes, specify…….

b. No

5. Have you taken any medicine as a preventive measure against Covid-19 infection /lower risk of covid-19 infection in the past 2 months without consulting your physician?

   a. Yes

   b. No

<u>If you answered NO to question 4 and 5 above, skip question 7</u>

6. Have you ever self-medicated in the past?

A. Yes

B. No

7. How many times have you taken medications to prevent COVID-19 without consulting a physician in the past 2 months?

   a. Once

   b. Twice

   c. Three or more times

8. If you answered yes in question 4 above, which drugs did you take?

a. Hydroxychloroquine

b. Ibuprofen

c. Vitamin C

d. Azithromycin

e. Amoxicillin

f. Zinc

g. Other, specify……..

SECTION C: FACTORS ASSOCIATED WITH OF SELF MEDICATION

Now I will ask you a few questions on factors associated with self-medication

9. Why did you prefer to self-medicate?

a. Illness was minor/ not serious

b. Quick relieve

c. Time saving/avoidance of long queue at the clinic

d. Cheaper

e. Known use by a friend or relative for similar symptom

f. Used the medication before for similar symptom

g. Easy accessibility to drugs

h. Knowledge about drug

i. Other, specify……

10. For the drugs you took, what was your source of information/advice about it?

a. Radio advertisement

b. Television advertisement

c. Physician

d. Friend who is a health-worker

e. Retail Pharmacist

f. Social media (Facebook, WhatsApp etc)

g. Internet (Google)

h. Friends/family

i. Other, specify……

THANK DRIVER AND END INTERVIEW

Time interview ended…….

APPENDIX 3

Appendix 3: Ethical Approval letter

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

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

My Ref. GHS/RDD/ERC/Admin/App 122/018
Your Ref. No.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Digital Address: GA-050-3303
Mob: +233-50-3539896
Tel: +233-302-681109
Email: ethics.research@ghsmail.org

17th January, 2022

Ruth Asantewaa Forson
P. O. Box WY 2355, Kwabenya, Accra

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

GHS-ERC Number	**GHS-ERC 037/11/21**
Project Title	Prevalence and Determinants of Self-Medication Practices for Covid-19 Prevention Among Public Transport Drivers in La-Nkwantanang Madina Municipal District
Approval Date	17th January, 2022
Expiry Date	16th January, 2023
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. James Akazili
(Head, Ethics & Research Management Department)

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