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Impact of Lifestyle Factors on COVID-19 Transmission Dynamics in Kabwe, Lusaka and Kafue, Zambia

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Abstract: ***This study examines lifestyle factors influencing COVID-19 transmission in Kabwe, Lusaka and Kafue towns in Zambia. Utilising a qualitative approach, data from 50 participants were analysed to identify elements like social practices and hygiene habits. Findings reveal significant factors such as social gatherings, public transportation usage, and personal behavious like smoking and alcohol consumption contributing to the virus spread. Recommendations include heightened awareness and targeted public health interventions.***

Keywords: COVID-19, transmission, lifestyle factors, Kabwe, Lusaka, Kafue

1. Introduction

The COVID-19 pandemic has affected millions of people worldwide, and Zambia is no exception. To understand the spread of the virus, it is important to consider the lifestyle factors that could impact COVID-19 transmission in different towns within Zambia. In particular, the towns of Kafue, Lusaka, and Kabwe may have unique lifestyle factors that affect the spread of the virus. Lifestyle factors such as social distancing, mask-wearing, and hygiene practices can play a significant role in reducing transmission rates. Additionally, other factors such as population density, access to healthcare, and travel patterns may reduce the spread of the virus in these towns. By exploring these lifestyle factors, we can gain a better understanding of how COVID-19 is spreading in Zambia and identify strategies for reducing transmission rates in these towns.

Recent studies have also shown that various lifestyle factors may affect COVID-19 transmissions, such as the use of public transportation, social gatherings, and access to healthcare facilities. In addition, factors such as smoking, alcohol consumption, and obesity have been linked to an increased risk of severe illness and death from COVID-19. To determine if these are the factors leading to the spread of COVID-19 in Kabwe, Lusaka and Kafue, this study will have to establish.

According to the World Health Organization (WHO), social gatherings and close contact with infected individuals are the primary drivers of COVID-19 transmission (WHO, 2020). This is particularly relevant in Zambia, where cultural and social practices often involve large gatherings of people. Additionally, the country's transport system, which relies heavily on minibuses and shared taxis, has the potential to spread the virus rapidly across different towns and cities. Furthermore, adherence to public health guidelines such as wearing masks and social distancing is low in some areas of Zambia (Chibwana et al., 2020).

According to a study by Moonga et al. (2020), social distancing and mask-wearing were found to be effective in reducing transmission rates in Zambia. Similarly, a study by Nkamba et al. (2021) found that hand hygiene practices were also important in reducing transmission rates. However, it is important to consider the unique lifestyle factors in each town, as these may impact the effectiveness of these strategies. For example, a study by Siziya et al. (2013) found that population density was higher in Lusaka compared to other Zambian towns, which may increase the risk of COVID-19 transmission. According to the World Health Organization (WHO), understanding the factors that contribute to COVID-19 transmission is crucial in designing effective interventions to prevent and control the spread of the virus (WHO, 2021). Therefore, this study will provide valuable insights into the lifestyle factors that influence COVID-19 transmission in Zambia and may inform policy decisions aimed at reducing the spread of the virus. Furthermore, an understanding of lifestyle factors affect COVID-19 transmission in Kafue, Lusaka, and Kabwe towns in Zambia is crucial in developing targeted interventions to reduce the spread of the virus. Through this research, we hope to contribute to the global efforts to control the pandemic and improve public health outcomes in Zambia.

2. Literature Review

Several studies have been conducted both in Zambia and outside on the novel virus COVID-19 since its outbreak in Wuhan city of China in the year 2019. Some of the research done include that of Chawe et al.(2020) which focused on the 'Knowledge, attitudes and practices of COVID-19 among Medical Laboratory Professionals in Zambia.' The study was a cross-sectional survey conducted among 208 medical laboratory professionals in Zambia from 10th to 29th June 2020. Data were collected using google forms and exported to the SPSS version for statistical analysis. Independent predictors of COVID-19 knowledge and practices were determined. Adjusted odds ratios and their 95% confidence intervals were reported.

The findings of the study revealed that medical laboratory professionals in Zambia have good knowledge and a positive attitude toward COVID-19. However, the study also showed that poor practices were observed. The study recommended the need for Continuous Professional Development (CPD) to ensure that medical laboratory professionals are well-informed and aware of best practices to aid in curbing the pandemic. The study, however, did not focus on the lifestyle factors that could affect the transmission of COVID-19 which is the focus of the current study. It is this knowledge gap that the present research intends to bridge.

Phiri et al. (2021), conducted an assessment of environmental and socio-economic factors using a classification tree approach to the spread of COVID-19 in Zambia. This study focused on understanding the association of COVID-19 cases with environmental and socio-economic factors in Zambia - a sub-Saharan African country. The researchers used Zambia's district-level COVID-19 data, covering 18 March 2020 (i.e., from the first reported cases) to 17 July 2020. Geospatial approaches were used to organize, extract and establish the dataset, while a classification tree (CT) technique was employed to analyze the factors associated with the COVID-19 cases. The analyses were conducted in two stages: (1) the binary analysis of occurrences of COVID-19 (i.e., COVID-19 or No COVID-19), and (2) a risk level analysis which grouped the number of cases into four risk levels (high, moderate, low and very low).

The results showed that the distribution of COVID-19 cases in Zambia was significantly influenced by socio-economic factors compared to environmental factors. More specifically, the binary model showed that distance to the airport, population density, and distance to the town centres were the most combination influential factors, while the risk level analysis indicated that areas with high rates of human immuno-deficient virus (HIV) infection had relatively high chances of having many COVID-19 cases compared to areas with low HIV rates. The districts that are far from major urban establishments and that experience higher temperatures have lower chances of having COVID-19 cases. The findings from this study present empirical evidence of the relationship between COVID-19 cases and their associated environmental and socio-economic factors. The current study, however, is focusing on lifestyle factors as opposed to socio-economic and environmental factors. Hence, it approaches the study from a broader perspective by not restricting itself to socio-economic and environmental factors in the spread of COVID-19 in Zambia. However, the current study was confined to three districts Kabwe, Lusaka, and Kafue.

Zambia has been identified as one of the top 18 risk countries in Africa that is most vulnerable to being affected by the fast-spreading virus. On 18th March 2020, the country recorded its first 2 cases and as of 20th August 2020, the country had recorded over 10, 000 cumulative cases and over 250 deaths. (WaterAid, 2020).

This assessment was intended to examine the likely impact of COVID-19 on Water Sanitation and Hygien (WASH) programme in Zambia among vulnerable communities through investigating physical vulnerabilities, social vulnerabilities, economic vulnerabilities, and household coping mechanisms from the selected communities.

WaterAid (2020) conducted an assessment whose purpose was to help identify hotspot areas, gaps, and targets for interventions to provide a clear analysis of the situation on the ground and generate evidence to inform planning and programming as the response progresses. The vulnerability assessment focused on the physical, social, and economic vulnerabilities people face and the coping mechanisms they employ. Further, the Assessment investigated knowledge, attitudes, and practices regarding COVID-19.

The mixed methods approach was utilised in a complementary way. For the quantitative survey, the main experimental design was cross-sectional, which was statistically designed for Chaisa, Ibex Hill, Kuku, and Matero locations. These locations were a mix of low and high-density areas with reported cases of COVID-19, at the time of the survey. A total of 431 sample against a planned target of 428 (100.1%) was achieved. The qualitative research component gained an in-depth understanding of the way communities were currently responding to the COVID-19 pandemic and their access to WASH services during this pandemic. A total of 20 Focus Group Discussions (FGDs) were conducted in the four targeted locations in Lusaka.

The results of the assessment indicated that although 94.2% of the survey participants were highly knowledgeable about COVID 19 with 89.3% having a good understanding of hygienic practices, especially washing hands using soap and water or alcohol-based hand rub, but there still exist gaps in other preventative measures such as social distancing and lockdown. Most households could not afford to buy soap/sanitisers, water containers, household water treatment options, and hand washing items. 85% of the participants regarded themselves as likely to be infected with COVID-19 in the future. The study recommended robust prevention and infection control among the communities.

Mudenda's (2021) study on factors affecting the continuous transmission, spread, and increased mortality associated with coronavirus disease 2019 (COVID-19), revealed that the spread of the first and second waves of COVID-19 was influenced by factors such as population density and weather changes. Areas that are densely populated have reported increased confirmed cases of COVID-19 compared to less populated areas. The main reason for this could be the fact that it is difficult to practice social distancing in overpopulated countries. Concerning temperature changes, most respiratory infections affect people when temperatures are low. This is exaggerated when there is increased air pollution in the environment. Economic factors have prevented countries to conduct a lockdown of epicentre towns and cities. This is in fear of an economic shutdown because some cities are economic cornerstones of countries. Politically, most political leaders have failed to lockdown their countries for the fear of losing political support from their citizens. Further, some traditional and religious beliefs have also influenced the spread of COVID-19, thereby leading to increased morbidity and mortality globally. The spread of COVID-19 has been worsened by people's

negative perceptions and misinformation that COVID-19 is a myth, and thus relax to adhere to the recommended preventive measures. Besides, comorbidities, poor health-seeking behavior, and lack of vaccines, inadequate treatment modalities, and test kits have worsened the failure to contain the COVID-19 pandemic. Could this be the case in Kabwe, Lusaka and Kafue? This study will have to establish.

Regarding Mudenda's (2021) study, it is clear that he looked at the factors in general whereas the current study restricts itself to lifestyle factors that could affect the transmission of coronavirus in Kabwe, Lusaka, and Kafue. Hence, the present study tries to bridge the gap that Mudenda and other researchers have not attempted to.

A study by Mendoza-Jiménez (2021) on 'Behavioral Risk Factors and Adherence to Preventive Measures: Evidence From the Early Stages of the COVID-19 Pandemic' revealed that Behavioral risk factors, such as smoking, excessive alcohol consumption, physical inactivity, obesity, and unhealthy food intake are added risk factors for severe outcomes of COVID-19 infections. The survey sought to determine whether behavioral risk factors (BRFs) play a significant role in adherence to preventive COVID-19 measures in a population aged 50 and above. The SHARE Wave 8 (Survey of Health, Ageing and Retirement in Europe) and SHARE COVID-19 Survey served as the database, resulting in an analytical sample of 17,588 participants from 23 European countries plus Israel. Of these 36.04% engaged in at least one BRF and 16.68% engaged in 3 or more BRFs. Multilevel logistic regressions revealed that engagement in one BRF was significantly associated with less adherence to hygiene preventive measures, i.e., hand-sanitizing, hand-washing, and covering coughs and sneezes (OR: 0.86; 95% CI: 0.78; 0.94), as was an engagement in two BRFs (OR: 0.85; 95% CI: 0.74; 0.97) and three or more BRFs (OR: 0.72; 95% CI: 0.59; 0.88). No such association was found between engagement in BRFs and adherence to social isolation preventive measures, i.e., avoiding meeting more than five people, visiting others, or going shopping, or regulated preventive measures, i.e., wearing a mask and keeping physical distance. The found association was also stronger when three or more BRFs were engaged in (1 vs. 3 BRFs: χ 2 = 3.43, p = 0.06; 2 vs. 3 BRFs: χ 2 = 6.05; p = 0.01). The study gives insight into the protective behavior of a population with inherent vulnerability during a global health emergency. The current study, however, focuses on lifestyle factors that could affect the transmission of the COVID-19 pandemic in selected towns in Zambia as opposed to the above study that was done in Europe focusing on behavioural risk factors and adherence to preventive measures.

Lange and Nakamura (2020), conducted a study on 'Lifestyle factors in the prevention of COVID-19.' The study indicates that confinement to the home and psychological distress due to the coronavirus disease 2019 (COVID-19) pandemic may lead to harmful health behaviours, such as overeating, sedentary behavior with reduced physical activity, elevated alcohol and tobacco use and increased screen time causing impaired sleep. They further reveal that High-energy "Western" diets and obesity are major risk factors for a more severe course of COVID-19. Alcohol use and tobacco also have detrimental effects on the immune system. Therefore, population-wide body weight control, reduction of smoking rates, and limitation of alcohol consumption are important preventive measures. Furthermore, sufficient restorative sleep is needed for adequate immune functioning. Appropriate lifestyle changes regarding nutrition, exercise, sleep, smoking, and alcohol intake may help shift the population distribution of infection risk and aid in preventing severe COVID-19. However, the current study is done in Zambia in Kabwe, Lusaka, and Kafue towns with a focus on lifestyle factors that could affect the transmission of COVID-19 without necessarily looking at the preventive aspect as in the case of Lange and Nakamura (2020) who focused on prevention.

Azuma et al. (2020) focused on 'Environmental factors involved in SARS CoV-2 transmission: effect and role of indoor environmental quality in the strategy for COVID-19 infection control' in Japan while the present study looks at the lifestyle factors that could affect the transmission of COVID-19 in Kabwe, Lusaka and Kafue in Zambia. Azuma and et. al (2020) study revealed the environmental factors involved in SARS-CoV-2 transmission, including a strategy to prevent SARS-CoV-2 transmission in a building environment. SARS-CoV-2 can persist on surfaces of fomites for at least 3 days depending on the conditions. If SARS-CoV-2 is aerosolized intentionally, it is stable for at least several hours. SARS-CoV-2 is inactivated rapidly on surfaces with sunlight. Close-contact aerosol transmission through smaller aerosolized particles is likely to be combined with respiratory droplets and contact transmission in a confined, crowded, and poorly ventilated indoor environment, as suggested by some cluster cases.

A systematic review of Risk factors for COVID-19 infection, disease severity, and related deaths in Africa by Gesesew et al. (2021) indicated that Demographic, institutional, political, and ecological factors were linked with high COVID-19 infection rates in Africa. The study also revealed that severe forms of COVID-19 were associated with comorbidities and specific demographic characteristics. Health system organisation and policy, politico-economic situation, the prevalence of chronic conditions, and lifestyle factors increase the risk of deaths associated with COVID-19.

African countries that heavily rely on international trade and tourism were likely to have higher infection rates than other countries in the region. As anticipated, the rate of COVID-19 infection was higher among densely populated countries given that the disease is mainly spread through close contact with infected persons. A similar finding was observed elsewhere.

African countries enjoying a stable political democracy have an open economy and well-connected air and road network and were found to have a higher risk of COVID-19 infection. This could be attributed to the fact that countries with strong democracies have a laissez-faire administrative system, where people are not obliged to obey and practice some public health measures that may infringe on freedom of movement and the pursuit of happiness. Democratic systems also go hand in hand with law and order and a

higher-than-average disposable income, which creates opportunities for leisure and work-related travel both internally and internationally, which increases the risk of COVID-19 transmission. In addition, countries with open economies and high transport connectivity are characterised by high mobility, facilitating the spread of the disease.

The studies included in this review reported mixed findings about the effect of temperature on COVID-19 infection. For example, the current review indicated that people living in countries with warmer temperatures are less likely to acquire infection. Contrary to this observation, some African countries such as Egypt, which enjoys warm weather throughout the year, are highly affected by the virus as compared with other African countries with relatively cooler temperatures. Yao and colleagues, however, demonstrated that temperature had no significant association with COVID-19 infection. As highlighted in the study, further investigation is required to determine the role of weather on the transmission and spread of COVID-19.

Age, particularly being an older person, was associated with more severe forms of COVID-19 at hospital admission. This might be explained by weaker immunity among older people. Patients with coinfections such as TB are more likely to experience severe forms of COVID. TB infection is common in low-resource settings and among older adults with pre-existing conditions resulting in high vulnerability to severe forms of COVID-19 infection. Evidence on the effect of COVID-19 on people with HIV and malaria is limited. A study by Karmen, Tuohy et al showed that being infected with HIV at the time of acquiring COVID-19 does not significantly increase the severity of illness or the risk of complications. However, further research is warranted as the available evidence is inconclusive. Most importantly, given the high burden of HIV and malaria in the African region, the molecular, genetic, clinical, and environmental implications of COVID-19 on people living with HIV and malaria should be explored in greater detail.

This systematic review demonstrated that several demographic, institutional, political, economic, environmental, lifestyle, and health system factors, as well as comorbid conditions, increased the risk of infection, severe forms of COVID-19, and deaths related to the virus in African region.

Statement of the Problem

The COVID-19 pandemic has become a major public health concern globally, and Zambia is not an exception (World Health Organization, 2020). Kafue, Lusaka, and Kabwe towns in Zambia have reported a high number of COVID-19 cases, and the transmission dynamics of the virus in these areas remain poorly understood (Zambia National Public Health Institute, 2021). Lifestyle factors such as diet, physical activity, smoking, alcohol consumption, and social interactions have been shown to play a role in the spread of COVID-19 (Chowdhury et al., 2020; Liu et al., 2020). However, the lifestyle factors affecting COVID-19 transmission in Kafue, Lusaka, and Kabwe towns in Zambia has not been extensively studied. Therefore, there was a need to examine the lifestyle factors that may affect COVID-19 transmission in these towns to inform the development of targeted interventions to reduce the spread of COVID-19.

Objectives

1) To evaluate the knowledge, attitudes, and perceptions of residents towards COVID-19 and its transmission in Kafue, Lusaka, and Kabwe towns.
2) To identify the most common lifestyle factors in Kafue, Lusaka, and Kabwe towns in Zambia that may impact COVID-19 transmissions such as diet, physical activity levels, smoking habits, and alcohol consumption.
3) To develop recommendations for policymakers and public health officials in Kafue, Lusaka, and Kabwe towns in Zambia regarding strategies for promoting healthier lifestyle habits and reducing the spread of COVID-19.

Significance of the Study

The study's significance lies in its focus on lifestyle factors that drive COVID-19 transmission in specific Zambian towns, providing insights essential for crafting localised public health strategies and interventions.

3. Methodology

The study employed a qualitative approach and a descriptive research design was used to determine the lifestyle factors that may affect COVID-19 transmission. Data were generated using an interview guide. The sample population was fifty (50) and data were analysed using deductive thematic analysis where data were coded and categorised into themes and sub-themes. Purposive sampling technique was employed to target the sample. Fifty (50) participants were subjected to interviews. The study adhered to ethical principles, such as obtaining informed consent from the participants, maintaining confidentiality, and ensuring that participants' rights were respected.

4. Findings and Discussion

This study is exclusively devoted to establishing lifestyle factors that could contribute to the transmission of COVID-19 in Kabwe, Lusaka and Kafue towns in Zambia.

When the participants were asked if they feared COVID-19, the responses were as shown in figure 1.

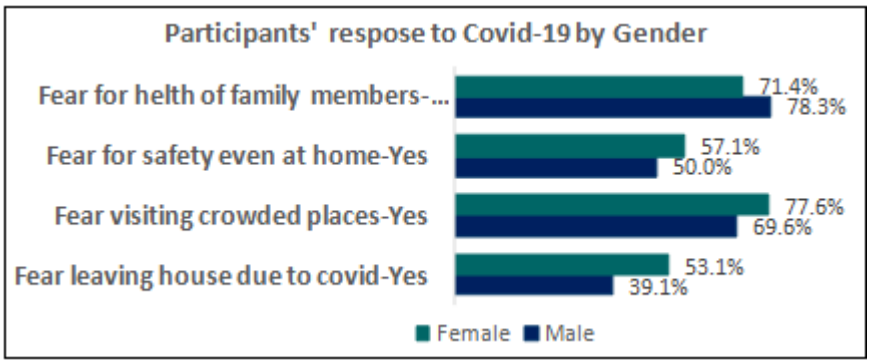

Figure 1

Furthermore, the participants were asked to state what they were doing to stop the transmission of COVID-19, figure 2 shows the responses.

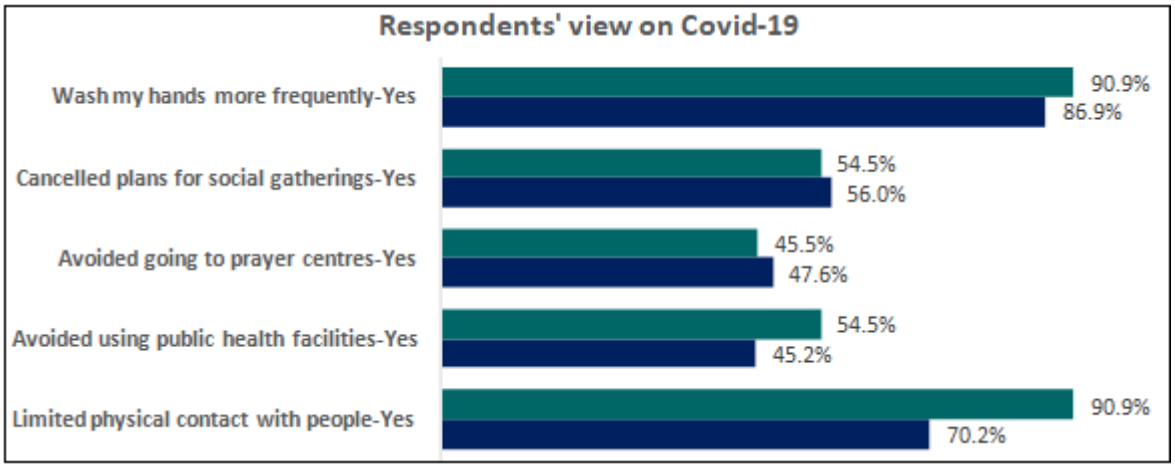

Figure 2

Objective 1 of the study was to evaluate the knowledge, attitudes, and perceptions of residents towards COVID-19 and its transmission in Kafue, Lusaka, and Kabwe towns. The study revealed several issues with COVID-19 such as:

Awareness of the dangers of coronavirus

The majority of the participants expressed knowledge about the existence of the coronavirus and its impact and symptoms. Some of the participants were even able to define coronavirus as submitted by one participant (KF) who defined it as

> *"it is a viral disease that is transmitted through greetings, coughing and talking. It started in China and its symptoms are coughing, difficulties in breathing, headaches, flu, and fever*."

Most participants also expressed awareness about the means of transmission of the virus such as handshakes, unmasking, and not washing hands frequently. However, their knowledge about transmission of the virus was variant with their actions as most of them were masked up at the time of this study. As regards knowledge about anyone who died of coronavirus, the majority expressed ignorance as participant (KM) submitted:

> *'I don't know any person who died of COVID-19. I just heard on TV.*' Another participant (LZ) added, '*No, I have never heard of anyone dying of coronavirus. We just hear about such things.'*

Another one emphasised*:*

> *'I have no idea what coronavirus is. I was just vaccinated without any explanation.'*

Although the majority expressed ignorance about people dying of the coronavirus, they expressed fear of the disease because of the way it was projected in the messages they got from those that were sensitising them to the dangers of COVID-19. This finding was in line with a study by Kim et al (2021) in South Africa which established that knowledge of COVID-19 vary among different people.

COVID-19 is Synonymous with the Rich

The study revealed that despite some participants taking precautionary measures against contracting the coronavirus, the majority said they did not do so. Others argued that the coronavirus was just a made-up disease from China and was meant for the rich. Participant (KM) said:

> *'Nothing can increase coronavirus, it is just a made-up disease. Here in the compound, there are serious contacts but no case of coronavirus has been recorded. Coronavirus is synonymous with rich people from the yards.'*

Another participant (KL) added,

> *'We don't fear because we are part of the clouded places. Here in the markets, we know each other very well. We don't fear the disease but the punishment from law enforcers. Those who fly to China are the ones who contract the coronavirus. Enforcing 1 metre apart guideline cannot work here in the markets where we are involved in trading.'*

When asked how often they sanitised or washed their hands and their workspaces as a way of preventing coronavirus, the majority of the participants indicated that they rarely did that. One participant (LM) said:

> *'We rarely wash our hands and our workspaces. We wash our hands when they are soiled with dirty [sic]. Also whenever we want to eat and as part of hygiene not because of the fear of contracting COVID-19.*

Another one (KM) emphasised,

> *'..and I don't need vaccination but God, hand sanitizing and masks.'*

The study further revealed that the majority of the participants considered COVID-19 a hoax since hospital staff did not mask up while attending to them whenever they visited the health facilities. To the participants, this was a signal enough to them that COVID-19 did not exist in the real sense of the word.

The above finding is consistent with the findings from observations made during the survey. Crowds of people were observed disregarding social distancing, especially in markets, clubs, social functions, church gatherings, bola bet shops, wholesale shops, and in public transport as can be seen in the figure below: (Insert photo here).

COVID-19 is a milk cow for the government

The study revealed that the majority of the participants had mixed feelings about the reality of COVID-19. They argued that it was exaggerated by the government for them to continue receiving money from the donor community. They were convinced that the number of cases of COVID-19 was systematically manipulated to create a picture of desperation to receive funding from outside the country. One participant (KB) remarked:

> *'Coronavirus is a way of getting money from donors. Corona patients do not even benefit from such monies.'* Another participant (KM) emphasised: '*I sell Kachasu and beer sharing is the order of the day and there are no cases of coronavirus. Some people are just making a lot of money through donations out of Coronavirus which does not exist.'*

Vaccination confines one to death

The study revealed that myths surrounding COVID-19 had a great impact on the participant's perception of prevention measures put in place by the World Health Organisation (WHO) and the government of Zambia. Most participants did not want to mask up or be vaccinated against cover-19 due to negative perceptions emanating from the myths such as masks from China having the coronavirus and also dying three years after vaccination. One participant (KL) submitted that:

> *'some masks from China are infected with the coronavirus. Why can't the government make local masks as opposed to importing infected masks from China? We also hear that people die after three (3) years of vaccination.'*

Another participant (KZ) added:

> *Where people have been forced to vaccinate, there should be measures taken against such activities. I have information that bus commuters in Gwembe district of Southern Province just before the 2021 general elections were forced to vaccinate. People should be educated on vaccination before being vaccinated to dispel the myths surrounding vaccination.*

The issue of myths about COVID-19 was common among the participants in the three towns and the above finding suggests that there was an information gap on COVID-19 vaccination in the areas under study.

Objective 2 was to identify the most common lifestyle factors in Kafue, Lusaka, and Kabwe towns in Zambia that may impact COVID-19 transmissions such as diet, physical activity levels, smoking habits, and alcohol consumption. The study of several lifestyle factors such as:

Handskakes and Hugs

The study revealed that the majority of the residents of research areas were accustomed to handshakes because as one participant (KE) indicated,

> *'shaking hands is part of African culture. Therefore, stopping people from this culture takes away the respect and courtesy that comes with greetings.'*

One interesting revelation about handshakes was the political connotation attached to them. It was revealed that greeting someone using a closed fist as the case was during COVID-19 pandemic was associated with a political party – the Patriotic Front (PF). The United Party For National Development (UPND) sympathisers found it difficult to greet with a closed fist as they associated it with the PF party symbol. Hence, they opted to greet with open hands. One participant (KC) said,

> *The closed fist is associated with a particular party. Hence, people avoid greeting using a closed fist, lest they can be mistaken for belonging to that political party that is in power whose symbol is a closed fist.'*

The above finding is in tune with the findings from the observations made during the study. Most people defied using closed fists when greeting. They opted for open-fist handshakes and hugs. Handshakes and hugs were not only observed in the markets, streets, and bars but also at funeral gatherings. The study established that most participants had an adequate level of knowledge, and more than half had correct perceptions and high levels of prevention measures

related to COVID-19 in the three townships where the study was conducted. However, some participants still felt that COVID-19 was a hoax of the government to get financial help. This finding highlights that the government and in particular, health authorities should continue to encourage citizens to access information from reliable sources and educational courses focusing on COVID-19. The finding was in line with a study by Plywaczewska-Jakubowska, Chudzik, Babicki, Kapsta and Jankowski (2022) which established that COVID-19 pandemic was not well understood.

Smoking (cigarette sharing)

The study revealed that sharing cigarettes is a lifestyle virtue that was common among smokers in all three towns of Kabwe, Lusaka, and Kafue. From the observations made, it was common to see smokers, especially in drinking places, sharing cigarettes while seated close to each other. The interviews conducted also confirmed that sharing cigarettes was common among smokers as one participant (LC) indicated:

> *'Fwaka sibatana,' for us smokers we share cigarettes no matter how short it is. You allow your friend to at least take two pulls if the cigarette is too small. That way, you feel you have helped your colleague as you know that cigarette smoking is addictive. You cannot be at peace until you have taken even two pulls [sic]. So you cannot deny a person who asks you just for a pull or so.'*

The above finding was a potential conduit through which COVID-19 would spread, and at variant with Lange and Nakamura (2020) who argued that appropriate lifestyle changes regarding smoking and alcohol intake may help shift the population distribution of infection risk and aid in preventing severe COVID-19. They further indicated that Alcohol use and tobacco also have detrimental effects on the immune system.

Alcohol Consumption

The study further revealed that the majority of those involved in opaque beer drinking rarely took precautions against the transmission of the coronavirus. They enjoyed drinking in groups popularly known as the 'black table' arrangement. One participant (KM) said,

> *'They share the drinking containers/glasses in a round table set up like those drinking the popular "junta beer (Locally made spirit)."*

This finding is in agreement with the observations done in bars and nightclubs in all three towns where patrons were seen drinking in groups around the tables without any iota of social distancing. This lifestyle factor posed a danger to the patrons as COVID-19 could easily be transmitted. The above findings were in line with the findings by Mudenda (2021) who observed that behavioral risk factors, such as smoking, excessive alcohol consumption, physical inactivity, obesity, and unhealthy food intake are added risk factors for severe outcomes of COVID-19 infections. From the observations, it was further revealed that among bar patrons especially in shanty compounds, exchanging drinking glasses was common. Although some participants indicated that they took precautions against COVID-19, the observation proved otherwise as one participant (LK) submitted:

> *'There is no social distancing in beer drinking especially when patrons get drunk and they shake hands often and don't even wear masks.'*

This was common among those that drank traditional beers called *Chibuku* and *Kachasu*. For them, exchanging beer cups was normal, and never cared about contracting the coronavirus.

Prostitution

The study revealed that prostitution was one of the lifestyle factors that could affect COVID-19 transmission because prostitutes mingled with a lot of people in a single night. As such, they were always in danger of contracting the coronavirus.

One participant (KT) said:

> *'These prostitutes mingle with a lot of clients without protecting themselves. There are a lot of truck drivers from different countries who mingle with our ladies, thereby putting them in danger of contracting the coronavirus.'*

Another participant (LC) added:

> *'This is the only way I can feed my family and pay rentals – through sex work. Any health dangers we are exposed to as sex workers are taken care of in our charges. On a good night, I have between 5 to 8 clients and when I knock off I make sure that I steam myself as a protection against COVID-19.'*

The above finding is consistent with the findings from the observations made during the night tour of the research areas. Sex workers were seen looming the streets while others were negotiating with potential clients without masks.

Pool table game

The study revealed that pool table game was a potential factor that could propel the transmission of COVID-19 through how the game is played. The game of Pool is played on a pocket billiard table with one white cue ball and 15 numbered object balls. The players use one shared stick (pool cue) to strike a cue ball which in turn strikes object balls. The goal is to drive object balls into six pockets located at the cushion boundary. The fact that there is only one stick that players share puts the players at risk of contracting COVID-19. One participant (LZ) said,

> *'Pool players usually spit in their hands to have a good grip on the pool stick thereby putting themselves in danger of contracting coronavirus if one of them is infected. They do not even sanitise the pool cue before another person uses it.'*

The above finding is in agreement with the observations made which revealed similar situations in the pool tables visited. Players were seen sharing the same pool sticks

without sanitising them and they were also seen spitting into their hands as they geared up to hit the cue balls.

Money Transactions

Money transactions were an inevitable activity that was observed during the current study. The study revealed that money exchange was a serious potential lifestyle factor that could affect COVID-19 transmission. One participant (KU) observed that

> '*some people may have the disease and it can be transmitted through money when they transact with one who has no disease.'*

From the observations made and the interviews conducted in the three towns, it was clear that people did not take precautions when transacting. The majority were not sanitising or washing their hands after every transaction, especially in booths. Also, very few booth operators were found with sanitisers. It seems the majority of the people did not appreciate moneyless transactions such as mobile money transactions. Even in the streets among street vendors and in bars and nightclubs, patrons were seen exchanging cash without washing or sanitising their hands afterward. One booth participant (LM) remarked:

> '*I can't manage to sanitise my hands each time I make a transaction. Besides, sanitisers cost money and I cannot afford to be buying sanitisers every day since I have a lot of clients*.' Another one (KK) added that *'I have the sanitiser with me but I don't use it each time I transact because if I did so, it would finish fast. I have no mother to be buying sanitisers.'*

Objective 3 was to develop recommendations for policymakers and public health officials in Kafue, Lusaka, and Kabwe towns in Zambia regarding strategies for promoting healthier lifestyle habits and reducing the spread of COVID-19. From the interviews, questionnaires, and observations done, the study generated some recommendations such as:

Decongesting the markets

The study revealed that most of the markets were highly congested and as such were potential hotspots for the transmission of COVID-19. The participants suggested that there was a need to reduce overclouding in markets by building more trading places. One participant (KM) said:

> *'We need good spacious markets if we are to curtail the spread of COVID-19 disease.'*

This finding was confirmed by the observations made which revealed that most trading places were overclouded in all three towns. This finding also confirms the findings by Phiri et. al (2021) that COVID-19 cases in Zambia was significantly influenced by the socioeconomic factors compared to environmental factors.

Bridge the Information gap on Myths around COVID-19

The study revealed that there was an information gap about vaccines and masks. The participants indicated that most people were hesitant to go vaccinations and masking up because there was a belief that one dies three years after vaccinations. And also that masks from China were infected with COVID-19 virus. One participant (LZ) said:

> *To end the coronavirus, health professionals should go into communities to sensitise them to the vaccine, to make them understand and appreciate the impact of the coronavirus. The way the government has been vigorous on HIV/AIDS should use the same steam to address the effect of the coronavirus.*

Another participant (LK) added that

> *'more sensitisation in the compounds should be done through theatre, public TV shows and many other platforms.'*

Some participants complained that they were vaccinated against their will because no information was shared with them before vaccination. Therefore, they suggested that there was a need to bridge the information gap so that people could make informed decisions before being vaccinated. One participant (KM) *remarked:*

> *'They just came here and grouped us and vaccinated us without telling us anything.'*

Another one (KM),

> *'My cousin went to the clinic for maternity and was given two injections instead of one. When she asked why she was given two injections, the nurse told her that the other injection was for COVID-19. She was not happy that they did not tell her in the first place. It is not fair.'*

Promote Cashless Transactions

The revelation that cash transactions have the potential to affect COVID-19 transmission calls for a paradigm shift in the way people transact by adopting digital transactions such as mobile money and bank transfers. The study revealed that there were a lot of people involved in cash transactions in mobile money booths and trading places without taking precautions against COVID-19 disease. Therefore, the only way to safeguard citizens from the deadly pandemic is to promote digital transactions through policy formulation.

Develop a pandemic policy

Based on the findings of the study, there is a proposal for the government to develop a pandemic policy that would only come into force when faced with any pandemic. The policy should only be triggered when any pandemic gets serious. This way, it will curb politicising the pandemic as the case was during the COVID-19 pandemic. One participant (LC) suggested,

> *'having a pandemic policy that spells out how any disease that threatens humanity should be managed would help avoid haphazard decisions as we saw at the height of COVID-19. For instance, the drink-from-home directive can be captured in the policy and can only be triggered when the situation worsens. Politicians will not take advantage of the citizens by bringing politics into the management of any pandemic since policy guidelines would be clearly defined.'*

5. Conclusion

The study concludes that a lack of understanding about COVID-19, coupled with lifestyle practices like smoking, alcohol consumption, prostitution, phsical money transactions, and public space congestion, significantly contributes to the spread and severity of COVID-19 in the studied towns. It recommends increased public awareness and vaccination programmes, empasising a multi-sectoral approach for effective pandemic containment.

Contribution: Findings from this study will add to the body of knowledge and literature of the existing limited numbers of studies conducted in Zambian on lifestyle factors that may affect COVID-19 transmission in Kafue, Lusaka, and Kabwe towns. The findings may inform public health policies and interventions to reduce the spread of COVID-19 in Zambia and other similar contexts.

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References

[1] Adon Chawe , Ruth L. Mfune , Paul Siyapila , Sharon D. Zimba , Pipina Vlahakis , Samson Mwale , Kapambwe Mwape , Memory Kalolekesha , Misheck Chileshe , Joseph Mutale Tobela Mudenda Grace Manda Victor Daka. (2020). *Knowledge, attitudes and practices of COVID 19 among Medical Laboratory Professionals in Zambia.* Available from: file:///C:/Users/jive.lubbungu/Documents/COVID%2019%20among%20Medical%20Laboratory%20Professionals.pdf. Accessed on 19/01/2020.

[2] Darius Phiri , Serajis Salekinb , Vincent R. Nyirendac , Matamyo Simwandaa , Manjula Ranagalage , Yuji Murayama. (2021). Spread of COVID-19 in Zambia: An assessment of environmental and socioeconomic factors using a classification tree approach. *Scientific African.* Volume 12, July 2021, e00827

[3] WaterAid (2020). *Rapid COVID-19 Vulnerability Assessment in Lusaka (Zambia).* Lusaka: NP.

[4] Mudenda, S. (2021). The Second Wave of COVID-19 and Risk of the Third Wave: Factors Affecting the Continuous Transmission, Spread of, and Increased Mortality Associated With Coronavirus Disease 2019 (COVID-19*). European Journal of Environment and Public Health*, 5(2), em0081. https://doi.org/10.21601/ejeph/11056.

[5] Mendoza-Jiménez M-J, Hannemann T-V and Atzendorf, J., (2021). Behavioral Risk Factors and Adherence to Preventive Measures: Evidence From the Early Stages of the COVID-19 Pandemic. *Front. Public Health* 9:674597. doi: 10.3389/fpubh.2021.674597.

[6] Klaus W. Lange , Yukiko Nakamura. (2020). Lifestyle factors in the prevention of COVID-19. *Global Health Journal* 4 (2020) 146-152. Available on https://www.keaipublishing.com/en/journals/global-health-journal/.

[7] Kenichi Azuma , U Yanagi , Naoki Kagi , Hoon Kim , Masayuki Ogata and Motoya Hayashi (2020). Environmental factors involved in SARS CoV-2 transmission: effect and role of indoor environmental quality in the strategy for COVID-19 infection control. *Environmental Health and Preventive Medicine* (2020) 25:66 .https://doi.org/10.1186/s12199-020-00904-2.

[8] Gesesew HA, et al. (2021). Risk factors for COVID-19 infection, disease severity and related deaths in Africa: a systematic review. BMJ Open 2021;11:e044618. doi:10.1136/bmjopen-2020-044618. Available at https://bmjopen.bmj.com/.

[9] Chowdhury, R., Luhar, S., Khan, N., Choudhury, S. R., Matin, I., & Franco, O. H. (2020). Long-term strategies to control COVID-19 in low and middle-income countries: an options overview of community-based, non-pharmacological interventions. *European Journal of Epidemiology*, 35(8), 743-748.

[10] Liu, M., Cheng, S. Z., Xu, K. W., Yang, Y., Zhu, Q. T., Zhang, H., ... & Wang, X. M. (2020). *Use of personal protective equipment against coronavirus disease 2019 by healthcare in Wuhan, China: cross sectional study*. BMJ, 369, m2195

[11] Zambia National Public Health Institute. (2021). COVID-19 Situation Report 42. Retrieved from https://znphi.co.zm/COVID-19-reports/

[12] Pływaczewska-Jakubowska M, Chudzik M, Babicki M, Kapusta J and Jankowski P (2022). *Lifestyle, course of COVID-19, and risk of Long-COVID in non-*

hospitalized patients. Front. Med. 9:1036556. doi: 10.3389/fmed.2022.1036556